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NATURALISM AND THE NATURE OF THINGS

NATURALISM, Santayana has observed, is the native and inveterate philosophy of the United States, antedating and underlying all our more highfalutin academic and churchly confessions. It has become explicit, however, at two very different levels, with two very distinct kinds of animus. There is a naturalism which is the evasion or surrender of the central philosophic enterprise, and there is a naturalism which is its most heroic prosecution and aspires to its most decisive triumph. In the present essay, after sharpening this contrast, I shall sketch out against its background the tenets and prerogatives of a whole-hearted or metaphysical naturalism, a 'materialism'. The result will sufficiently serve its purpose if it helps a little to accustom our fatigued and cautious generation to the notion that the truly empirical and scientific philosophy is not a meticulous defeatism, but a full-dress ontology, running the risks and meeting the challenge of the great systems of the past.

"Naturalism" connotes at least a method, and sometimes a metaphysics. As a method, naturalism consists in unequivocal allegiance, down the whole gamut of belief, in every department of life and knowledge, to experience and logic, particularly the scientific logic of empirical inquiry. This need not mean a willingness to accept piecemeal the sciences in lieu of philosophy, and still less does it mean to accept the philosophies of scientists (which are usually mentalistic, mystical, or agnostic). It does mean to assert that no knowledge of synthetic fact is of a higher denomination than the deliverances of the several natural sciences, and that if and when the latter are overridden, they must be so, not by revelation or reason, but only on their own terms, by better attested or more pervasive empirical hypotheses.

As a metaphysics, naturalism is what R. W. Sellars has called "physical realism".[1] It can hardly be called "physicalism" because that name has been pre-empted by persons seeking a merely semiotic 'unity of science' which explicitly rejects physical realism. The name "materialism" has been smirched by invidious associations, due partly to its use in moralistic literature to stigmatize piggishness and bad manners, partly to the frequency with which pugnacious materialists have attached themselves to antiquated theories of matter, and partly to a passionate philosophical opposition which has deliberately utilized these circumstances to denigrate the doctrine. "Materialism", however, is the most descriptive and venerable title, and I shall hereinafter, for the sake of candor as well as brevity, use it interchangeably with "physical realism" or "realistic naturalism".

Physical realism, or materialism, is in brief the doctrine that the whole of what exists is constituted of matter and its local motions, not Aristotelian 'prime matter' but physical matter, and is hence 'physical' in the literal sense that all its constituents are among the subject matter of physics. Every entity—stone or man, idea or essence—is on this principle a vulnerable and effective denizen of the one continuum of action, and in the entire universe, including the knowing mind itself, there is nothing which could not be destroyed (or repaired) by a spatio-temporal redisposition of its components.

Physical realism is not a postulate or an *a priori* certainty, and it is not entailed by the canon of scientific logic. It is at most only confirmed by the empirical evidence in accord with that canon. If the evidence were favorable to some other metaphysics, to objective idealism, say, or Mohammedanism, then the courageous and reasonable naturalist, cleaving to his method rather than to the metaphysics traditionally associated with it, must accept idealism or Mohammedanism with natural piety. There are some non-materialistic metaphysicians who do valiantly defend their theses by inductive arguments—E. S. Brightman, for example. With them we can amiably and profitably dispute when we are ready

[1] R. W. Sellars, *The Philosophy of Physical Realism*, New York, 1932. Sellars defends "materialism" in "Dewey on Materialism", *Philosophy and Phenomenological Research*, III, 1943, 381-392.

to survey our specific evidences. Most of the metaphysical rivals to physical realism, however, provide against the almost certainly adverse verdict of the empirical method by rejecting that method *von vornherein,* and claiming the privileges of some other faculty than inductive intelligence and logical analysis—some vital intuition, empathy, revelation, or creative Reason. With these philosophers, who in an exact epistemological sense are 'mystics', the naturalist's differences are too profound to be argued here.

At present, however, the most vindictive attacks upon materialism have been coming from quite the opposite quarter, from persons calling themselves 'naturalists'. The paradox of naturalistic opposition to materialism is frequently, to be sure, no more than protective coloration, a ruse to divert the hounds of supernaturalism from the naturalist's trail. Sometimes it is an equivocal acknowledgment that certain kinds of materialism are *passé.* Very commonly, however, it represents something else, much deeper and broader than either of these motives, namely, 'positivism'; that is, a rejection by the naturalist of all metaphysics, naturalistic or supernaturalistic. A large and vocal majority of contemporary naturalists, in sooth, while *bona fide* 'naturalistic' in their confidence that only the method of logic and experience will attain the truth, are not metaphysicians, not 'realists', and hence not materialists, because they deny that the truths attainable by the one cogent method of science are ontological, having to do with 'things in themselves', 'ultimate reality', 'antecedent reality', or the like. The positivism of such naturalists may take the simpler and more forthright form of averring that only facts concerning experience, data, sensa, operations, responses, psychophysical transactions, practical consequences, or some other aspects or elements of the cognitive processes, can be meaningfully referred to. More frequently, at the moment, however, they are content to write of 'functions', 'perspectives', 'frames of reference', 'subject matters', 'contexts', and 'procedures', and to pronounce with inimitable hauteur such assurances as "Cognitive consciousness and physical process are complementary aspects of the same on-going existential continuum". The language of the latter variety of 'critical naturalists' would sometimes appear to sustain an ontological interpretation. That strictly they comprise a wing of the same phenomenalistic

party with the franker positivists, however, is witnessed not merely by their common genealogy and their exchange of compliments, but also by their common resentment of Anglo-American realism and the boast that by their doctrine each of the persistent problems of philosophy is either exposed as not a genuine problem at all, or bequeathed to a special science.

If the leanest kine of philosophy are not to eat up the fat, the materialist must league with whatever other unabashed philosophers may still aspire to knowledge in the grand style. The following pages are accordingly intended to set forth with a tolerable degree of system the physiognomy of a downright metaphysical naturalism, its main principles, its inexorable problems, and, in outline, its irresistible evidence. We proceed by showing, first, principally in despite of the agnostic species of naturalism, that physical realism embodies at any rate a possible variety of knowledge, empirically meaningful, empirically confirmable, and uniquely distinctive, and second, for those who grant the relevance of empirical evidence to metaphysical conclusions, that it is in excellent accord with observed facts, and very likely true—not a mere convenient construction or manner of speaking, but a diagram displaying the ground plan of what is actually or 'absolutely' the case. Although the argument thus divides, perhaps too noticeably, into two principal segments, the defense of empirical metaphysics in general and the defense of materialism in particular, I hope to make apparent that it is in the unison and reciprocity of the components of these two phases that the strength of the naturalistic philosophy resides. The largeness of the subject which I thus attempt to reduce to manageable dimensions may help excuse some of the dogmatic abruptness of my assertions.

The first and most arresting obstacle to the materialist's undertaking is the familiar positivistic doctrine that no metaphysical statement, that is, no statement referring to the nature of things in themselves irrespective of the sensations or operations by which we deal with them, can be significantly framed. Just how many philosophical writers have actually believed the doctrine thus crudely expressed is difficult to say: our pragmatists and logical empiricists have been notoriously cagey toward unsympathetic redactions of their opinions. The above, however, is the sense in

which positivism and pragmatism have been most widely understood, and the sense which gives them their importance. Enough of its influence is still abroad, at any rate, to warrant a statement of the contrary analysis of meaning accepted immemorially by the empirical realists of the Occident, though not always so univocally pronounced as the purist could wish.

The requisite statement can be abridged, somewhat roughly, to the following propositions. (1) The connotative meaning of every statement and the content of every belief must consist of adjectival components discoverable in the experience of the person aware of the meaning or content. (2) A statement or belief, general or singular, is true if it corresponds with the facts in accordance with stipulable conventions. (3*a*) Whether such truth subsists in any specific instance is ascertainable in the case of some propositions, namely, those which are necessary and analytic, by examination *a priori* of the meanings themselves. (3*b*) It is ascertainable in the case of others, synthetic reports of direct experience, by comparison of the belief with the conscious data to which it pertains. But (3*c*) it is only indirectly and probably confirmable, in the case of others, by comparison of its deductive consequents with experienced data.

In short, whereas the meaning of a statement must be derived from some experience, (1) above, and its confirmation must be derived from other experience, (3*c*) above, the statement need in no sense be *about* either of these experiences, but may significantly be as metaphysical as we please. The object of knowledge is no more 'constructed out of experience' than a mountain is constructed out of the pigments with which a painter portrays it. Sensations and operations can be meant, if anyone cares to go to the trouble, but no better and no worse than electrons or angels, than the fortuitous concourse of atoms or the communion of the saints. The sole assignable limit to the scope of metaphysical meanings is that we cannot refer to any object which not only is unexperienced but is totally dissimilar in every respect to anything which has been experienced. (Whether *it* ever will be or can be experienced is irrelevant.) But even if we waive the self-contradiction of the latter conditions (for some similarities are *a priori* necessary, while even to impute dissimilarity is to impute a kind

of secondary similarity), probably no metaphysician has ever wanted to claim for his objects any such monstrous alienation, and certainly the materialist does not.

The metaphysical skeptics, however, have not shot their last bolt with positivism. There are those who, while not claiming in general the inconceivability of the transcendent, argue that any attributive monism, like materialism, every assertion that there is one universal stuff or property, like "All is material", "All is mental", "All is numerical", is meaningless.[2] They have recourse sometimes to the idea that every property must 'have an opposite', so that there could be no materiality, for example, unless there were some immateriality, and sometimes to the supposed logical principle that if a term has universal extension it must be devoid of intension. Now, it may be conceded that every property does 'have' a contradictory, but it does not follow that the contradictory need have instances. Certainly the logical principle of the inverse variation of extension and intension does not require it to have instances. That principle, indeed, is a loosely conceived corollary of the law of subsumption, *All SP is P*, which entails that a conjunction of properties cannot have more instances than any of its conjuncts, but entails nothing otherwise of how many instances either property may have. The argument which we are disputing is thus *prima facie* inadmissible because, like the ontological argument, it does pretend to deduce existence from essence. Its consequent rejection of all laws of the form *Everything is P*, including the law of identity, *Everything is identical with itself*, yields results as surprising as they are incredible. But even if we granted that there cannot occur instances of a property *P* unless there are instances of non-*P* as well, so that a material organism, in a material chair, in an environment material to the horizon, could deduce from this very surfeit of materiality that there must be something immaterial somewhere to keep it going, *how much* of the latter must there be? With this question answered, the physical realist need at worst only amend his doctrine: Everything is material *except* the catalytic trace of enough immateriality, at the bottom of the cosmic retort, to enable the rest to be material.

[2] See M. R. Cohen, *Reason and Nature*, New York, 1931, p. 42; E. B. Holt, *The Concept of Consciousness*, London, 1914, p. 135; W. S. Jevons, *The Principles of Science*, London, 1883, p. 701; C. W. Morris, *Six Theories of Mind*, Chicago, 1932, pp. 99-100.

His sufficient and more decorous justification, of course, is that we ordinarily first recognize or conceive a property without knowing or caring about the size of the class which it determines, and no subsequent enlargement of the class can obliterate the conception.

There are none the less important truths which the skeptic's doubt reflects as in a dark glass. One is that the metaphysician must confine himself to the contention that his universal property, *P*—fire or water, mind or matter—is common only to all entities of some one logical type, presumably to all individuals of the o level. Another is that he cannot, without at least flagrantly defying experience, assert that *P*, the property which everything has, is the only property which anything has. Beyond this admission, he has his choice of several procedures. A very mild metaphysical monism would be content to aver merely that everything which exists, no matter what other properties it may have, has also the property *P*. A less mild but still moderate doctrine would contend furthermore that *P* and its 'modes', its specifications or more determinate values, comprise the executive order of the world, so that by a knowledge of it and of certain laws of correlation we should be able to predict, understand, and sometimes control the sequences of all the other properties. The most extreme view, finally, would hold that the other properties of the world are not only determined by but actually composed out of modes of the property *P*, as a triangle is composed of lines or a mind (perhaps) of sensations.

It is a capital misapprehension that a monistic metaphysics, especially materialism, denies the differences among things. It is a kindred misapprehension that any one monistic metaphysics, say materialism, is doomed to be equivalent, except verbally, to any other, say mentalism. Either materialism or mentalism would indeed be absurd if it maintained that there is no difference between a mind and a cookstove. The materialist, on the contrary, because he can recount how they are alike in their ingredients, can explain exactly how they are different in their composition. The mentalist, if he is equal to his job, can do the same. The rival metaphysicians, however, differ profoundly and explicitly with regard to what the common components are and what are the specific differences of composition.

The supposed logical difficulty in saying that a mind is matter

(or that matter is mind) is as specious as that in saying that a spoon is silver, and the supposed indignities and anomalies of 'reduction' are equally specious. To show how a hero's aspiration, for example, is composed of the same sort of elements as a piece of slate, does not in any sense involve 'reducing' the heroic aspiration to pieces of slate. It does involve 'reducing', in an important and intelligible sense, both the aspiration and the slate to components which *ipso facto* are simpler than they, and in a sense 'inferior' to them. Reduction of this sort is merely analysis, and any understanding of the nature of a thing, and any understanding of the origin of most things, depends upon analysis, and so depends upon 'reducing the higher to the lower' in this sense. The process does not at all impugn the 'reality' of the objects analyzed, or their value or importance, save so far as someone may previously have imputed to them a different kind of components, implying a promise of a greater value or importance in the future than the present analysis can offer. The components which the analysis uncovers are more important than the composite just in the sense that they are, of necessity, more fundamental and pervasive; and in this oddly figurative sense, and because they are generally more enduring, they may be called 'more real' than the composite.

Professing naturalists of the positivistic schools have underlined the paradox of their position by joining the other enemies of materialism in denouncing reduction on principle. This is paradoxical in a scientific philosopher because to decide that any entity is irreducible altogether, either because it has no components or because we cannot find them, is to admit a blank defeat for the scientific intelligence. The whole point of the main naturalistic disgruntlement with Cartesian dualism, in particular, was that Descartes left the world divided between two mutually *irreducible* attributes. Whenever a contemporary philosopher exults that characters of the world are not reducible to each other or to any common element—such as electronic patterns—he is rejoicing that they are sundered, not merely from the electronic fabric of physical nature, but from each other, by innumerable 'rifts in being' none of which is a jot less abysmal and catastrophic than the one which Descartes established between his two substances. To complain of materialism, conversely, that it is exceptionally reductive,

is to complain that it is or aspires to be extraordinarily cogent.

So much for the abstract possibilities with regard to meaningful metaphysical construction. Whether materialism suffers some special disability must be decided by noting its particular structure. This is not so easy as one would expect. The materialisms of Democritus and the eighteenth century were perspicuous enough: they found their type experiences, their 'root metaphors'[3] in bits of ivory or stone and in the operations of machines. Theirs was an intelligible and intelligent hypothesis, but the progress of science has dispossessed it. Though some enemies of materialism still affect to believe that a materialist *must* hold that the world is a swarm of dice and billiard balls, they do so just because such a version not only is repulsively redolent of the pool room and the gambling den but is highly improbable. The materialist, holding that the world is matter, is not wedded to any one doctrine of the nature of matter. Now, to this conceptual commodiousness there can be two kinds of objection. One is genuinely philosophical, that the new physical categories are less competent than the old to deal with the phenomena. This, however, is clearly false. Nobody seriously believes that the concept of atoms and the void is more apt and versatile than the concept, for example, of force fields or space strains. The other objection is terminological: that the new concepts are so different from, and so superior to, the old, that the philosophy which utilizes them cannot significantly be called by the same name. The thread of identity, however, which enables us to say that Democritus and the latest physicist are both talking about the same stuff, 'matter', is patent in the facts, not only that they claim to be examining the minute composition of the same macroscopic objects—pieces of bronze or wood—but that the elements which each reports are primarily *shapes*. Shapes, spatio-temporal configurations, were the only distinctive qualities of Democritus's atoms, as they constitute the whole nature of the 'matter' of modern physics. What the physical realists of all ages agree on is that every concrete real thing, and its every element or aspect, is located and extended in a single space-time system, and can be wholly accounted for by chronogeometrical formulas. 'It is of no relevance

[3] See S. C. Pepper, *World Hypotheses*, Berkeley, 1942, esp. 186-231, on 'Mechanism'.

whatever whether the space-occupying elements are small, solid, spherical atoms, . . . or whether they are unit electric charges or clusters . . . of electromagnetic waves.'[4]

Physical realism thus specified is a perfectly meaningful thesis because specific spatio-temporal patterns, and the determinable attribute of spatio-temporal pattern in general, are plainly discernible among the constituents of experience. But in the narrower description of the detailed form of the physical world structure, there remains much room for improvement. Far more time and energy have been squandered on the positivistic kind of 'construction' or 'constitution', which does not ask what the fundamental action-patterns are like, but only flounders behind the Sisyphean rock of formulating the totality of possible evidence for them, than are spent on the realistic kind of analysis which would disclose the content of the fundamental concepts by tracing them home to ostended characters. What is required is suggested by the boisterous hyperbole of Stephen Leacock who describes the *nature*, as opposed to the *symptoms*, of the electron, by bidding us imagine an Irishman whirling a shillelagh, faster and faster, and getting smaller and smaller, until the Irishman and the shillelagh evaporate and leave only the whirl.[5] Unsatisfactory and facetious as this account is, it at least attempts the cardinal task evaded by the physicist or philosopher of science who, having been cozened into renouncing 'models' and 'picture-thinking', confines himself to statements, not of the structure of the atom or the cosmos as it is in itself, but of the sensory titillations by which it manifests itself to the human animal.

While the physicists brace themselves for a more manly account of their categories, the naturalistic metaphysician can sketch in the major design of the world order without declaring more precisely

[4] W. P. Montague, *The Ways of Things*, New York, 1940, p. 89. The same acknowledgment is made by Pepper, *World Hypotheses*, p. 186; by Bertrand Russell, *The Scientific Outlook*, New York, 1931, p. 120; and by L. S. Stebbing, *Philosophy and the Physicists*, London, 1937, pp. 273-78. W. C. D. Dampier-Whetham, on the other hand, in *A History of Science*, New York, 1931, p. 329, contrasts the materialist's 'lumps of dead matter' with 'non-material' 'systems of protons and whirling electrons', and the preacher H. E. Fosdick (*Adventurous Religion*, New York, 1926, p. 158) rejoices that 'there are no gross and carnal atoms, but spirituelle electrons instead'.

[5] "Common Sense and the Universe", *Atlantic Monthly*, CLXIX, 1942, p. 630.

on the nature of the ultimate elements than that they are 'patterns of action', processes or events completely describable in terms of space-time coördinates. If this is a philosophy of 'events', it differs from most such philosophies by stipulating for one precisely definable kind of event. It has no truck with indeterminate allusions to matter as 'a dark principle' which it would be 'frivolous to attempt to define'.[6] If "functionalism" stands for the belief that the world is composed of actions, then the materialist is a kind of 'functionalist'. He will be chary of the name, however, because of a suspicion that those who most exploit it have availed themselves of the unconscionable ambiguity of "function", to agglomerate the quite distinct notions of a *property* (Russell's 'propositional function'), an office or *rôle* ('Roosevelt in his function as commander-in-chief. . .'), an *action* (biological 'functions'), a *purpose* ('the function of a machine'), a one-many *relation* (a logical function), a law of *co-variation* (a functional connection in nature), and a mere *effect* (as when 'a man's political opinion is a function of his economic status').

Physical realism in the above terms is independent of mechanism, that is, of the extreme determinism which holds all events to be determined by simple laws pertaining directly to the local situations of the minutest elements. As various sorts of mentalism can be thoroughly mechanistic, so conversely a materialism is compatible with any amount of vital spontaneity, from the palest tychism, through diverse shades of organicism to the ruddiest teleology. The Epicureans, like some modern physicists, plugged for indeterminism, though on grossly insufficient evidence. Only a deterministic materialism, however, furnishes those main advantages which make materialism the most intelligible of philosophies. Further decision awaits further evidence, but one thing is certain: the main question of mechanism, teleology, or total indeterminism, is not appreciably affected by whether the physical configurations evince 'class laws' or 'field laws', 'wave laws' or 'particle laws'.[7]

[6] Quoted from Santayana's *Realm of Matter*, pp. 14 and 18, by W. R. Dennes, "Santayana's Materialism", in *The Philosophy of George Santayana*, Evanston, 1940, p. 422.

[7] All laws, of course, including those which pertain to 'fields', are class laws, but the belief that there is some alternative to class laws, and even to class logic, is so common today that the *caveat* is justified. Pepper, Montague, and Russell, as cited above, identify materialism with mechanism.

Our description of physical realism patently assumes the reality of universals or essences—at least *universalia in rebus*. It does not 'hypostatize' them any more than does the child who observes that the ball is round and that the orange is round *too*. Whether there 'are' universals is, in point of fact, a question of logical analysis wholly distinct from the factual issue between any two metaphysical doctrines such as materialism and mentalism, and is to be confronted by all metaphysical parties, and by the anti-metaphysician, on exactly the same terms. A virile naturalism will refuse pointblank to bow the neck for that old man of the sea, nominalism, which has ridden so much modern empiricism. What the materialist is interested in is the *kinds* of *universals* which are instantiated in the world: he maintains that all of them are spatio-temporal properties.

If the formulation of materialism is independent of the problem of universals, so is it independent of the counterpart problem of prime matter and material substance (Berkeley's '*x*'). We have described the physical world as a congeries of instantiated universals, properties, forms. The 'matter' of materialism has nothing to do with Aristotelian prime matter, but is a principle of structure. Whether properties or forms, of whatever sort, can exist without being embedded in a matrix of prime matter, or congealed around a core of metaphysical individuality, is also a question of logical analysis wholly distinct from any controversy between materialist and mentalist—or positivist—and to be approached abreast by all parties.

Now, as soon as physical realism is set forth with some degree of precision and polish, the same detractors who once charged it with being an odious grotesquerie are ready to charge it with being an obvious truism, having no intelligible alternative. On the contrary, the statement of materialism thus clarified not only means something; it means something distinctive, arresting, illuminating, a thesis so far from empty and obvious that, unfortunately, it has been expressly denied by a great majority of philosophers and philosophasters. It has seldom been wholly without adherents; it is the philosophy taken for granted by a good many educated men, including especially those engineers and scientists who have not been corrupted by mysticism or phenomenalism; but most of the

populace of Christendom, and most metaphysicians dignified with livings, lay or ecclesiastical, have emphatically refused to admit that everything in the universe can be ruined or repaired by local rearrangement. They have believed in slathers of non-physical, non-spatial, and even non-temporal reality, beyond the corruption of moth and rust, either supplementing material reality or supplanting it: minds, soul, spirits, and ideas, transcendent ideals and eternal objects, numbers, principles, angels, and Pure Being.

The materialist, however, as a dogged empiricist, should be the last person to think his doctrine established because it is clearly and distinctly conceivable, or because it has the ambivalent virtue of unpopularity. The all-important question is its empirical credibility. Just because materialism is a unique, contentful, and controversial proposition, it requires factual confirmation, not in order to be meaningful but in order to be credible. We confront then the next misgiving of the philosophic defeatist, that whether or not the meaning of a metaphysical declaration like materialism is constituted by its confirmability, it is at any rate incapable of being confirmed—that even if we can *refer* to an external physical world, we cannot *infer* to it. This objection in turn is a forensic onion compacted of several layers. Its outer rind is the neo-Humean contention that *no* statements beyond what the lingo of the day calls "protocols" and "tautologies" can be validly confirmed—rather, that confirmation and induction are not logically valid processes, and provide no reason whatever, but only a psychological inducement, to accept their conclusions. Those who believe this, but deplore it, generally express it by saying that 'the problem of induction is insoluble', or has been decided in the negative. Those who believe it but are rather pleased than otherwise, generally express the same opinion by saying that 'the problem is a pseudo-problem'. The principles of confirmation and induction are, on this philosophy, not to be disclosed and vindicated by logical analysis, but are to be compiled by an anthropological study of the modes of behavior of the organisms classified by the Census Bureau as 'scientists'.

The validation of an objective or logical probability for induction is a topic too ticklish and special to be pursued here. It should be observed, however, that the chief authority for the skeptical

position is still Hume's argument, and Hume, a 'man of letters', blandly indifferent to the whole logic of probability, achieved no more in his lax and affable discourse than to point out, logically, that an induction is not apodeictic, and psychologically, that the burned child nevertheless shuns the fire. Neither of these rather obvious propositions, of course, is inconsistent with the possibility of a demonstration that induction has logically what we always thought it had, the same *kind* of cogency as deduction, but of less *degree*. Such demonstration, I think, is now feasible, though not within the limits of the present essay.

Whatever the fate of induction in general, the situation of the metaphysician is no more parlous, in principle, than that of less ambitious knowers. On the issue of confirmation as on that of meaning, if the veto on metaphysics could be sustained, then no knowledge would be valid, not even knowledge of the wretched realm of experience and operations to which the positivist would confine us. Conversely, if the habit of confirmation can nevertheless be endorsed for the scientist or the industrialist, it can, in the same pickwickian way, be endorsed for the metaphysician. All attempts, in particular, to discriminate specially against metaphysical hypotheses on the score of their 'transcendence' are in principle mistaken. The reputed extraordinary horrors of the 'gulf', the 'bifurcation', the 'veil', between mind and nature, between experience and thing in itself, are so far as logic goes quite fictitious. The only logical problem resides in the prosaic numerical distinctness of what I am directly aware of at this instant and what I am not, whether the latter be the next pulse of my own consciousness or the inmost core of an alien substance. Conversely, if the writ of induction runs from now to *now*, it runs from here to the ends of any possible universe.

The next layer of objections to metaphysical hypotheses condemns them not on the ground of their transcendence of experience, but only in so far as they pretend to deal with the whole of the universe, on the ground that the universe as a whole is a unique object, not subject therefore to the canons of probability. Hume, in his *Dialogues*, foreshadowed such objection; Peirce immortalized it in his reminder that universes are not 'as plenty as blackberries'; P. W. Bridgeman has used it to damp the cosmological

fervor of R. C. Tolman. It is, however, invalid. Every object is unique in some respects, and no empirical inference is valid if its objects must be exactly like their observed predecessors. All objects, on the other hand, must be in some respects similar, including the universe and its experienced parts. Only in these respects, indeed, can we conceive the universe, and only our conceptions of it can we wish to confirm. The unique feature of the whole of things, that everything happens to be included in it, has no special relevance. Not only is a cube which is made up of cubes as much a cube as any of its components; most of its properties can safely be induced from theirs.

Casting up our accounts to this point, we observe that physical realism is in sum a meaningful, consistent, and essentially confirmable hypothesis. We turn accordingly to assess its credibility *a posteriori*, in relation to the actual evidence, as we should that of a scientific theory or a war communiqué. We can know forthwith that materialism, granted that metaphysics is confirmable at all, is in principle the most thoroughly confirmable of all world hypotheses. It *invites* the most conclusive confirmation or disconfirmation. The ideal aim of systematic knowledge is to disclose the fewest primitive elements into which the diversest objects are analyzable, and the fewest primitive facts, singular and general, from which the behavior of things is deducible. Metaphysics is the most 'scientific' of the sciences because it tries the hardest to explain every kind of fact by one simple principle or simple set of principles. It is the most empirical of sciences (as Peirce reminded us) because, by the same token, a metaphysics is relevant to and confirmable by every item of every experience, whereas every other science is concerned with only a few select and abstract aspects of some experiences. Physical realism is the ideal metaphysics, the veritable paradigm of philosophy, because its category of spatio-temporal pattern best permits analysis of diverse complexity to uniform and ordered simplicities, is most thoroughly numerable, and so most exactly and systematically calculable. Socratic purposes, Platonic ideals, Aristotelian qualities, Plotinian hierarchies—these are surds in comparison with a *système de la nature*, limned in patterns of action in the ordered dimensions of a spatio-temporal hypersphere.

The virtues thus celebrated give materialism its unique heuristic value, as at least the standard of comparison and point of departure. They comport also a coherence and simplicity which genuinely boost its antecedent probability. Mere *a priori* advantages, however, they are weak as water against the smallest pebble of empirical circumstance. The truly empirical defense of physical realism, to show that it jibes in the requisite respects with the data, falls in three phases: to show that it is in no regard inconsistent with experience; to show that it not only is consistent with but entails and explains experience; and to show that it has no rivals which in these respects are equal or superior.

Unquestionably the most serious onus of materialism has always been its apparent flat contradiction of immediate qualitative data. A color, a smell, a tone, an emotion, do not seem like patterns of action. But if colors are not physical, and colors exist, then it is false that everything is physical. Materialists from Democritus to Hobbes and our own psychological behaviorists have gone to various desperate lengths of denial and evasion to square their doctrine with these vulgar but unmistakable data. The greatest irony of the affair, and an instance of the bizarre irresponsibility of much philosophical debate, is that the materialism which Galileo had to vaunt as 'a rape of the senses', a triumph of transcendent reason, the philosophy which has more trouble in accommodating sense experience than anything else, and perhaps more trouble with sense experience than does any other current philosophy, is castigated by its enemies as a 'sensuous' philosophy, 'superficial', 'content with appearances'.[8]

For the present, this 'problem of secondary qualities' takes on different complexions for two varieties of physical realism, milder and more pretentious versions, in line with possibilities which we explained earlier. For the milder version there is no difficulty: the materiality of the world consists merely in the fact that every concrete real entity is material in that it contains at least certain specific modes of action pattern. Things may have color, hardness, holiness, and what not, which are quite distinct from extension and

[8] Thus J. Maritain disparages Democritus as a 'superficial intellect' mewed in 'the flux of sensible phenomena' (*Introduction to Philosophy*, New York, 1930, p. 52).

action, but which must be accompanied by the latter in any concrete thing, and indeed correlated with them, so that every specific color, *e.g.*, is perfectly associated with a specific kind of action pattern. This doctrine, which seems to be a thesis of some naturalists who disclaim materialism, is intelligible and is compatible with experience, but its countless irreducibles, as we have seen, re-introduce a myriad fold the elements of incommensurability which have made Cartesian dualism, epiphenomenalism, and the like, unpopular among the cognoscenti. The second and the tougher brand of materialism, if it squares with the facts, is vastly the more reasonable alternative: not just that every property occurs along with a pattern of action, but that every property, every abstract component of every concretum, *consists* of patterns of action, as a triangle, a cyclone, or a bear market plainly consists of patterns of action. This requires, in the present instance, that the ingredients of conscious experience are, with respect to their internal structure, in a subtle sense 'different' from what they 'seem'. More accurately, a quality which we experience as a massed whole may actually have an internal complexity, the components of which we can discriminate only indirectly, by inference. Every quality is a *Gestaltqualität*, and the color red can literally be constituted out of pattern elements none of which is red, as a triangle is of lines none of which is triangular. If this were a purely *ad hoc* device, it would be rightly suspect, but it proves itself a very fecund principle, a *vera causa*, right down the line, to account for all sorts of other anomalies which are no exclusive liability of materialism.

Here in the problem of experienced qualities is the crux of the problem of 'reduction'. Few persons would argue that a triangle does not really consist of lines, or that a clock is not wholly composed by its parts and their configuration. Only in mass qualities like pink or patriotism can they locate even a *prima facie* irreducibility. The rococo charm of irreducibility, however, is considerably diminished when it is observed to pertain no more to piety, for example, than to a color or a smell. It is almost completely lost by those non-reductive naturalisms which, while contending that experienced qualities do not literally *have* physical components, maintain that they *act* exactly as though they had, so that however luscious in the present, they augur no better for our destiny than

so much molecular machinery. The doctrine of *Gestaltqualitäten*, involving as it does a unique categorial apparatus, may be taken to reconcile with the prerogatives of analysis some modicum of that absolute 'emergent novelty' for which the decriers of reduction contend. An 'emergence' so transparent and ubiquitous, however, is hardly worth the trouble of naming.

The physical analysis of the special character of *consciousness* is in principle provided for by modern relational theories of mind in union with the physical concept of pattern of action. Though the materialistic account is not yet complete, it is as nearly complete as any. Certainly it cannot be estopped by such Philistine queries as "So your mind is material? Then what good are its conclusions, including your materialism?" or "So thoughts are spatio-temporal events; where, pray, is your idea of democracy, and how many cubic inches does it occupy?" For the first, there is no law of logic that a conclusion must be false if it is drawn by a physical organism. A belief is true if it corresponds to the facts; an inference is valid if its premise actually entails the conclusion. It does not matter whether the believer and inferrer is a machine or a demigod —though experience indicates that adding machines, at least, set a pace which a demigod is unlikely to surpass. More specifically, there are available already quite proficient accounts of how a neuromuscular organism not only could but must acquire habits of valid inference and veridical belief. For the second objection, it is sufficient to retort with the old poser, "How long is a piece of string?", or "How big is your digestion?" No one doubts that digestion and string are physical, and in all their particular instances have determinate dimensions.

There can nevertheless be read into the second query ("Where is your idea of democracy?") one of the crucial problems of philosophy, not peculiar to physical realism, but peculiarly clear-cut and poignant for it, namely, the question of the location of any conscious experience, including 'ideas', with respect to the rest of the world. In constructing a metaphysics, with the aid of the preliminary and partial surveys of the sciences, we construct a sort of chart of the universe, and the universe thus portrayed accounts for the articles of experience by being supposedly correlated with them item by item according to stipulated laws. The explanation

is pragmatically satisfactory if its laws of correlation enable us to anticipate experience. The psycho-physical problem, however, the 'problem of knowledge and its object', is the problem of determining the actual *location* of the experiential content with respect to the rest of the world. Our ordinary world-map, however trustworthy for ordinary affairs, does not, like a map in a subway station, carry a star indicating *where the map is*. The star must be written in by the epistemologist. The psycho-physical dualist says that the map itself exists entirely outside the physical part of the world which it depicts. The physical realist, however, holds that the field of our experience is truly identical with one of the physical areas delineated on the map; in other words, that we are always directly experiencing a part of the mapped region, which we consequently know twice over, once mediately and once immediately. *Which* of the mapped regions, however, is identical with the content of experience (including the map)? This problem, the most intimate, the most inescapable, the most 'concrete' of all problems, proves remarkably intractable, and it is easy to find implausibilities in any answer. For the physical realist, of course, the two chief alternatives are the epistemological dualism of Sellars, according to which the content of consciousness is located inside the head of the percipient organism, and the objectivism or direct realism of Alexander, according to which the content is 'out there', and embraces, generally speaking, at least the façades of external physical objects. (If a third alternative is conceivable, objective relativism, functional realism, or contextualism, defying the absolutism of an outworn logic by declaring that every item of content is both inside the head and not inside, it is too recondite for rapid treatment here.) On the first view, my 'idea of democracy' can be no more than a few inches long at most; on the second, it may spread over thousands of miles and thousands of years—though in either case, no doubt, what distinguishes it from other ideas is not so much its size as its shape.

It has been an embarrassment to realistic naturalism that each epistemological party brought against the other what were boasted to be crucial experiments to prove its impossibility, thus disseminating the impression that realism is in general stumped by the problem of knowledge. The first party have argued that the

characters of experience are incompatible with the characters which the map imputes to the external objects—the real railroad tracks do not converge, the perceptual streaks do. The second party generally indulge the ancient and erroneous scruple that an intra-cranial experience must be an impenetrable barrier to knowing extra-cranial events. Now, there is here at stake a real question of fact, susceptible of rational resolution, and not in the least a pseudo-problem or a matter to be settled by conventions of language,[9] any more than is the question whether a given airplane is above Nebraska or Oklahoma. Psychophysical dualism was a contentful hypothesis provoked by apparent disparities between experience and *any* part of the physical world. Epistemological dualism was a contentful hypothesis provoked by apparent disparities between experience and just those parts of the physical world which it is supposed to perceive. Either hypothesis is an honest scientific attempt to meet an insistent empirical problem which cannot be shrugged off without leaving a gaping fissure at the very apex of all our science.

When we bring knowledge and gumption to bear on the psycho-physical problem instead of trying to exorcise it, the mutual refutations of the parties turn out far from conclusive. Both alternatives are still live options: like most mysteries and insoluble problems, this one consists not in the absence of any adequate solution, but in the prevalence of too many solutions. Our experience may be inside our heads, or outside, or partly inside and partly outside. Every one of those hypotheses is compatible with the occurrence of genuine knowledge.[10] At present we know enough neither of our experience nor of our heads to decide, but the objectivistic theory (direct realism) has at any rate the merit of befitting best the traditional hardihood and ambition of materialism, and of being by far the more stimulating and suggestive

[9] As argues, for example, A. J. Ayer, *The Foundations of Empirical Knowledge*, New York, 1940.

[10] This is one of several crucial assertions which I must here make with peremptory-seeming brevity. It is treated with more detailed justification in "Truth, Error, and the Location of the Datum", *Journal of Philosophy*, XXXI, 428-38, and in previous essays there cited. The empirical realist's account of meaning, outlined on an earlier page here, is developed in "The Realistic Interpretation of Scientific Sentences", *Erkenntnis*, VII, 169-78. Some uses of the principle of *Gestaltqualitäten* are suggested in two articles in *Analysis*, III, 75-80, and V, 85-94.

working hypothesis. In the meantime, wherever the conscious content may be, materialism does not deny but guarantees its *effectiveness*, both as a medium of knowledge and as a spring of action.

Physical realism, however, not merely is consistent with the facts of sense and knowledge; it actually entails and explains them. It explains so much so well, in fact, that most persons find it hard to give the materialistic scheme any credit as a 'philosophy' at all, and so feel privileged to shop elsewhere for metaphysical pabulum. The movement of the stars and the winds, the composition of stones, the nutrition of plants, the reproduction of animals, the behavior of men—one by one, contrary to a very general expectation, these proved amenable to cognate principles of the one system of spatio-temporal pattern. The whole amazing advance of the sciences has consisted almost wholly in the assimilation of diverse phenomena to configurations analyzable to common physical components. Materialism cannot now, and perhaps can never, deduce every event from the dispositions of an original cosmic nebula; but it does all that any metaphysics, or indeed any science, can do: it predicts the major lineaments of the subject matter, explains a good many particular facts, and shows schematically how a further host of minor explanations may be expected to fit in.

However well and widely physical realism explains, this would avail it nothing if it had rivals which explain equally well and widely. Now, it does have rivals. In contending for the validity and urgency of empirical metaphysics, the physical realist admits the legitimacy of contrary hypotheses, and should welcome their insight and emulation. Panpsychism, personalism, Cartesian dualism, Congregationalism, and a hundred others can be clarified and defended, each with its indefeasible meaning, its empirical virtues, and its shocking lacunae. If physical realism is true, it is true because these are false; it is probable only in so far as these are improbable. The metaphysical naturalist can debate profitably and sympathetically with such competitors as he cannot with the positivist. A forthright psychophysical dualist, for example, who can account systematically for the disparities between sense experience and the objects of physics by hypothesizing that they belong to two orders of being, is nearer in temper to a hearty

realistic naturalism than is the pragmatist who pontificates that mind and nature are a seamless whole but proposes not the ghost of an idea how, in detail, the one fits into the other.

Nevertheless, if we count together the simplicity and explanatory power of physical realism, we can hardly doubt that it is superior to all its rivals. Even the idealist or the dualist, when he actually wants to understand or control something, makes use of the spatio-temporal schema. Not only does the personalist repair his car on mechanical principles rather than apostrophize that spiritual nature which professionally he imputes to it; he finds that even the ills of human personality—insanity, for example—are better medicined in accordance with physical hypotheses and by explicitly physical methods than by specifically idealistic. The empiricist had no original predilection against spirits, final causes, eternal values, or the other conceptual apparatus of the anti-naturalist. On the contrary, these concepts were for centuries given every opportunity, and it was wholly conceivable that they would prove capable of explaining and predicting the evidence. This is exactly why the fact that they signally failed to do so is a clinching argument against them.

If the rivals of materialism have any advantage it must be because there are *some* phenomena which they can explain better. Now, most of the phenomena which the supernaturalist throws in the naturalist's teeth are such as the supernaturalist himself has never explained. Thus the materialist's withers are unwrung by Will Durant's challenge to explain 'the laugh of a child' as by Alfred Noyes's to explain naval architecture and women's love-lit faces.[11] In the first place, as it happens, he pretty well does explain these estimable occurrences, and in the second place, and more significantly, he knows that Durant and Noyes have not actually tried to *explain* them at all, and almost certainly could not—except as they ride on the materialist's coattails. A humbler but more truly refractory class of data we observed in the qualities of sense experience. It is doubtful, however, if even with respect to these

[11] See Durant, *Story of Philosophy*, New York, 1925, p. 539, and Noyes, *Collected Poems*, New York, 1913, I, 87. Other authors have used the same argument less piquantly. Durant was taking Santayana's word that Santayana is a 'materialist'. Santayana's metaphysics, however, is a Platonic-Pythagorean trialism of matter, mind, and transcendent essences, about as remote from materialism as Western philosophy ever got.

the advantage of idealism or dualism is more than apparent. The *prima facie* discrepancy between quality and structure would remain even in the mind of God, and must always be resolved, if at all, by some such device as the materialist's.

The most relentless opposition to physical realism comes from those who argue that morality and religion are inconsistent with it. This premise, to be sure, has been a two-edged weapon, since the hearer is as likely to find in it an excuse for giving up morality and religion as a reason for giving up materialism; but it is in fact false. To understand this, we must distinguish between the problem of 'satisfying the demands of morality and religion' by explaining the actual data of the moral and religious experiences, and 'satisfying their demands' by ascribing to them the same significance which some moralists and religionists desire and believe them to have. The empirical philosopher owes a duty only to the former.

The moralist's objections to materialism have been a job lot: sometimes that the materialist can have no morals, sometimes that he must have bad morals. The charge that the materialist can have no morals is supported by the argument that obligation, the heart of morality, presupposes categories incompatible with materialism: namely, *value,* presumed to be *toto caelo* different from natural fact, and *freedom* to act in behalf of value, which is inconsistent with determinism. To this the materialist, supposing that he is unready to reject morality, replies that it is integral to his philosophy to show how values *are* natural facts, as colors or numbers are, and that freedom is neither inconsistent with materialism nor strictly required by morality. We have noted already that a materialist may be or not be a determinist, but it is equally true that a moralist may be or not be a determinist. Some of the greatest moralists, notably Spinoza, have been determinists, for moral obligation in fact requires only that some modes of behavior be voluntary and that some be *better* than others. Whether such behavior be metaphysically undetermined is irrelevant, save to some ferocious and archaic philosophies of retribution.

The charge that the materialist must have bad morals usually stems from the assumption that his morality must be egoistic and hedonistic. Now, if egoistic hedonism is true, it cannot be *bad,* and

even by conventional standards it is not as black as it is painted. But the association between materialism and egoistic hedonism is anyhow quite adventitious, due in large part to the confusion between the philosophical and literary meanings of "materialism." Of all philosophies, the least congenial with *ego*ism or *self*ishness is one which, like materialism, is most frequently accused of denying the ego or the self, and which in fact does assert that we are all members one of another, overlapping whorls in the universal ocean of action. And of all philosophies, the least equipped to make *pleasure* the mainspring of behavior is the materialism which is most notoriously baffled by qualities, and baffled *a fortiori* by such impalpable qualities as the affective tones. Materialism *per se* does not entail any one ethical system, but it is most congenially combinable with a kind of altruistic perfectionism like that of Bernard Bosanquet, who was much nearer being a first-rate materialist than the second-string idealist he fancied himself. As an ultimate moral guide, materialism puts to shame its competitors, positivistic or supernaturalist, by being able to provide plans of action commensurate with the vastness of its affirmations and the orderly exactitude of its analyses.

To genuine religion, as absolute idealism has had the virtue of emphasizing, the existence or non-existence of an enormous man-like but intangible Creator and Providence is almost entirely irrelevant. A materialistic philosophy lends itself rather better than most to the uses of the true religious spirit, the intellectual love of God, and that ultimate loyalty and sense of high tragedy which spoke in the cry, "Though He slay me, yet will I trust in Him". It is a disappointment only to the earthlings with the false insurance-policy concept of religion, for whom the Lord's chief function is to *prevent* them from being slain. As Plato knew, if there is a really reptilian atheism which deserves our shudders, it is the impiety of those who, whether or not they believe that there are extant specimens of the genus Deus, make their allegiance to life and holiness conditional on a confidence in supernatural connivance.

As physical realism does not really encounter any difficulties which do not at least equally obtain for other ontological hypothe-

ses, neither does it encounter any which are evaded by abrogating ontology in favor of compendious descriptions of experience, on the pattern of positivism or pragmatism. Divers species of phenomenalism are, to be sure, quite conceivable and possible alternatives. Although the same epistemological claustrophobia which shrinks from psychophysical or epistemological dualism, shrinks from the confession that each of us can experience no more than he experiences, the latter is as incontestable as it is harmless. Since it is incontestable, it assures the abstract possibility of assorted subjectivisms; since it is an analytic truism, it bolsters them no more than it does the most gigantic realism. The sole virtue of the subjectivisms, therefore, is their apparent avoidance of problems like the relation of mind to matter or of God to the world. In fact, however, they only change the venue. The phenomenalist evades in practice such questions, not because the method of empirical construction circumvents them, but because he has been unable to carry his constructions through. It takes all his time to give a pragmatic account of so simple a fact as that the earth is round. If he could wind up such workaday business, however, he would find his constructions even pragmatically incoherent until he solved problems exactly homologous with the physical realist's. As he must decide whether experience is 'as if' the electron is a particle or a wave or a composite of the two, so he must decide, by precisely the same criteria as the metaphysician, whether percepts are 'as if' they are inside the percipient's head or outside.

The candid student, in fine, cannot be blamed if he concludes that the only reason that physical realism seems vulnerable at all is that it explains so much more so much better than other philosophies that the imperfections of its explanations are noticeable. As solipsism gains undeserved credit by being so preposterous that its bare possibility looks like evidence in its favor, so materialism suffers by having so few difficulties that one difficulty more or less makes a difference. A *blasé* public do not expect idealisms and dualisms to *explain* anything. With innocent cynicism, we appreciate that these philosophies were designed for a different purpose, and are doing all that can be expected in a logical way

if they avoid contradicting themselves and the obvious facts of experience. The physical realist seems constantly riding for a fall because he is on the only horse really entered in the chase.

It is most excellent testimony to the high confirmedness of physical realism that so many of its competitors renounce confirmation as a criterion. It is a tribute to its power of explaining the appearances that its competitors call it 'a philosophy of appearances' (for we have seen that it is not 'a philosophy of appearances' in any other sense), and that the persons who hate it are preëminently the persons who hate understanding, the mystery lovers. It is a tribute to the scientific advantage of materialism that the application of scientific method in philosophy is so often decried as a begging of the question in its favor, and that materialism is called a 'presupposition' of scientific method, or scientific method is alleged to be limited to material reality. The logic of science has in sooth no presuppositions and no limitations. It is analytic and *a priori*, like *Eggs are eggs*, and inexorably germane to any possible world, monistic or dualistic, theistic or atheistic, chaos or cosmos. The hand-in-glove conformity of physical realism and scientific method is no logically preëstablished harmony, but the empirical fit of a beautifully concordant hypothesis with the facts.

Physical realism is not a foregone conclusion, but it is so lucid and probable that to defend it is, in this day, to defend integrity and understanding. To be loyal to it is to be loyal to philosophy, as to be loyal to philosophy is to be loyal to knowledge and to life. Materialism has often been patronized as a naïve and childish philosophy, and this judgment of it is less unjust than most. Materialism is the philosophy of the pre-school child as of a pre-Socratic and pre-sophisticated culture. It is the philosophy of limpid minds concerned only to know what most likely is actually the case, not yet distraught by the desire to turn ideation to the uses of compensation, obfuscation, or denial. For us in America today the contrast between the high-hearted metaphysics of naturalism and all the fine evasions of obscurantism and agnosticism may be literally of epochal importance. For the culture of America, by reason of its unique provenance, may choose either to be old or to be young, to be Alexandrian or to be Milesian. Whether we are thus at the end of a career or the beginning of one, will in large

part depend upon whether our citizens in this century learn their lessons from mystic evangels who would purge us of scientific understanding, from resigned sophisticates who set up languages and toy with thoughts of their future possible sensations, or from philosophers who explore the nature of things.

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WHAT IS MAN?

I. MAN THE PROBLEM. Our time reveals what several centuries were preparing. Man is challenged; man has become a problem to himself; man is in danger. Is there such a thing as "man"? That is the question.

The Faustian period between Renaissance and this world-revolution has undermined that being which was assumed to exist as human; we witness the explosion. An experiential-senate-nominalistic individualism or liberalism dissolved man into brittle atomistic entities, each all out for its own happiness, assuming this anarchic egotism would result in the welfare of all. A rationalistic-quantitative-mechanistic naturalism developed an impersonal system of "causal determinism", in which man was degraded into a functionary emulating his idol—the machine, the absolute state, the "collective". In skeptic-romantic-psychologistic immediacies man either dissolved in a chaotic flux of sensations without unity or substance, or escaped into the naïve dreamworlds of primitive folk-lore.

What kept these "modern" centrifugal tendencies in a spurious agreement was their common negativism, their common godlessness, their common hatred of the Christian-universalistic culture, their common resolve to deprive man of his being, to extract his roots in an absolute being and in a divine eternal order of creation. The present revolution clears away the "sentimental remnants of culture", which for a long time have been explained away as "superstructures" or denounced as hypocritical "sublimations", and frankly declares the supremacy of the beast or the robot over man.

But all these negations are human. Man must reclaim them as his own. On this self-understanding and self-mastery hinges the possibility of a human culture of the future, which will not be a return to any past, or any "status quo". Through the theoretical and practical negations of himself, the idea of man must rise, resurrected.

It is right, it is necessary that man should have become a problem to himself, because he is, in truth, a problematic being. He has

become for himself what he is in himself. But in understanding his real situation he also transcends and affirms it.

Man has problems and man is a problem to himself, because he has irretrievably broken away from an unconscious harmony with nature. The story of paradise lost is true, and all longing "back to nature" can never result in a happy animal but only in a deranged human. Selfknowledge distinguishes man; he is reflective, uncertain what he shall become. And this existential and educational question—what to become?—is not only an individual problem, but extends to his children, his fellows. Man is concerned not only for himself individually, but he asks what shall become of us all. Selfknowledge, based on man's break with nature, is individual and it is universal; it is human; it constitutes humanity.

And the problem is continuous. As such the problem is the basis for man as history maker. Against this continuous self-educational struggle for the true definition of the self, nature appears as unhistorical, as self-less. What is called natural history is not historical; new forms of organization appear in successive changes, but these new species are new kinds, they are not in remembered continuity with their previous selves. In historical religions, states, and cultures man embodies his conception of himself. History is man's shadow. What he theoretically knows, what he practically anticipates, what he technically invents, what he artistically imagines, what he himself passionately embraces and affirms, is his philosophy, and his philosophy is the unifying core of what becomes historical institutions, cohesive and coherent "ways of life", traditions. They are social vehicles and communicators of his philosophy.

But man is not only a historical, he is also a dialectical being. As soon as he has embodied and worked out his selfknowledge, he discovers the limitation of what he thought to be an answer to his problem. No finite answer can satisfy his infinite quest of that totality which he is and which he seeks. He thus breaks not only with nature but with himself and with his own past. And every such crisis is accompanied by dread and by dreadful events. Every decisive change in the life of man, whether individual or collective, implies the anguish of a final selfexamination. The same human conviction necessitating the change, also resides in the shape of life

he is trying to overcome. And so man lives in selfcontradiction. He distinguishes his own past, his own objective embodiment from himself, and nevertheless remembers his past embodiment as being one with himself. "What-was-being" becomes appearance. He distances himself from himself but remains nevertheless the same man in his selfdiremptions. Otherwise they could not continuously affect and excite him as his own possibilities. Man is thus both historical process, self-becoming, and also the standing center of unity, "substance", the owner of all the relative projections and perspectives which emanate from him and return back to him. Negatively, man can not understand himself merely as object, given to his memory—"nothing given exists"—nor can he understand himself merely as subject, as responsible and active agent without that for or against which he acts. He exists and understands his human existence only as the dialectical unity of opposites. He *is* both what he knows of himself as given in his experience of himself, and also what he ought to be and seeks to be ideally; this unity of opposites *is*, and is man's ontological definition and status. Existentially this unity of opposites is lived as conflict, and dialectic is the logical, that is, the universal and necessary, formulation of the truth of human existence in the world. Dialectic thinks what is, it is ontological.

Dialectically man is existential estrangement, certain uncertainty, at once contracted in the individual, and center of its universe, at once the rational point-of-reference for all thinking and a most irrational momentary flux. Man could not know what man is, could he not identify man with himself; yet equally man could have no experience of man, if he were not different from what he experiences.

To understand man we must understand the unity of his contradictions.

II. ALIENATION. Man as nature is a body subject to the regularities and behavior patterns referred to as "laws" of physics; as organism, he shares with other organisms the rhythmic recurrences of biological processes, such as birth and death, sickness and health, mating and procreation, phases of ageing, or the daily rhythms of sleeping and waking, being hungry and being fed. Nature in man

is identical with all the automatic, repetitious, unconscious or conscious but involuntary processes and rhythms which are the psycho-physical material noticed in external observation. This natural man is a man which happens to us, often disagreeably surprises us in accidents and maladies, and always and inevitably kills us in the end.

The natural man is a stranger, whom we have to accept as our partner, but whom we never cease to distrust. Or we may trust him in the beginning, but then we shall make an experience with him which will destroy this confidence. The whole medical science with its hospitals, schools and industry is the visible embodiment of this distrust of man in his natural partner, but also of his intense anxiety to please and to preserve him.

Out of this care for and distrust of the natural man, many natural sciences have originated—biophysics, biochemistry, physiology, genetic and structural anthropology. And all the specialized medical disciplines know many different things about many different aspects of the natural man, all those aspects that are open to a common external observation and subject to repeated experimentation. But they know nothing of man, because man knows them. This is now to be demonstrated.

1. Man, construed as object of natural sciences, dissolves into an aggregate of contradictory approaches and levels of more or less generalized, more or less quantified abstractions. They are incompatible among themselves, if they are identified with the reality which they are supposed to know: myself. They remain compatible only if they are known as abstract statements, onesided isolated perspectives concerning physical appearance. One approach, which considers man as a machine, is incompatible with another which sees two hundred million living cells serving in the most varied functions and carrying on battles against intruding armies of alien germs; the view of an integrated whole, balancing all organs, of an integrated and closed organic system of muscular-nervous-glandular interaction and interdependence, is contradicted by the view of an infinitely open system, which is seen as a restless process of building up and carrying away materials, through which the organism is infinitely interfused with its environment.

2. The selection of man as object of naturalistic knowledge, is,

from the point of view of these natural sciences themselves, an unfounded and arbitrary prejudice. It is dictated by nothing but a practical predilection. Nothing specifically human can be found in the nature of cells and molecules, and the peristaltic movements of Julius Caesar are not different in kind from peristaltic movements of the rat. The objective and impersonal uniformity of nature has no room for the personal and subjective uniqueness of man. He evaporates in a net of innumerable general relations, which are external to him. He gets lost in anonymous processes of general character. Man measures phenomena, but he is making himself ridiculous if he attempts to apply this to himself. For example: "About 10^{27} atoms go to build man's body, and 10^{28} as many make the average star".[1] Well, this medium sized assemblage between an average star and an average atom might also be a monkey, or a stone of the proper average proportions.

3. Natural man was referred to several times as an externally noticed appearance. This contains the epistemological crux of the argument.[2] There is no logical identity between thyroid glands and cretinism, between chromosomes and genes and a moral character, between vitamins and rickets. All naturalistic accounts of man are, in the last analysis, based on sense-impressions. I must see an eye before I can tell how it looks or how it resembles a complicated camera. I appear to myself in terms of my own sensuous responses. Physical appearance is logically identical with being-for-an-other. As such the body is an external image, changing with the perspective of the beholder. Natural man is a mirror for others and he mirrors otherness. He is man in self-alienation. And therefore it is impossible or grotesque to identify the image I have of you with what you are. But on the other hand, the body or my physical appearance is also medium or vehicle of my communication and self-expression. Thus, the natural man is both one and not one with myself.

To sum up: Man as object of natural sciences disintegrates into a congeries of uncertainties, rationally construed in exact and general terms and external relations. To explain himself by what

[1] Dampier, *History of Science*, New York, 1943, p. 435.
[2] Gustav Mueller: "The One and the Many", *Philosophical Review* LIII, 1, Jan., 1944.

he is not, is metaphysical suicide or a practical method of description without metaphysical significance.

The organs and cells of biological description are still something relatively understandable, because they still bear some resemblance to man himself. Elements, molecules, and atoms, however, abstracted from these organic members, in turn dissolved into energy radiations, annihilate man in a perfect system of quantitative equations—a triumph of man's own ability of exactly measuring an ever evanescent content of his external experience.

III. IMMEDIACY. Many Treatises, Essays, Confessions, and literary works try to grasp human nature in its immediacy; they thereby hope to overcome the strange man in nature, who is lost in the overpowering magnitude of inorganic, cosmic forces, and the strange nature in man, which alienates man from himself. This subjective selfunderstanding of man identifies him with his own individual functions. My seeing and hearing, all my sensory functions, my feelings of pleasure or pain connected with them, my memories and anticipations, as well as my present daydreaming, denote such individual and immediate functions or states of mind. They are all I-existent, they are inseparable from the actual and experiencing self.

But this immediacy also has its own dialectic. The immediate self is one and many at the same time; there are many functions occurring at once, more or less focussed in my unifying attention. The immediate self is Now in a double sense; on the one hand it is the flickering now of rapidly passing processes, on the other hand it is the timeless now, the *nunc stans*, the everpresent "stage" of all the processes which are always I-existent and I-related. In this second sense of an eternal now it is the I think which accompanies all the changing processes of actual experience.

The immediate self, further, can not be perceived because it does the perceiving now, it can not be remembered because it does the remembering now. What I refer to as myself, what I anticipate or remember of myself is never the actual immediacy. Any autobiographical or historical remembrance selects images which lack the I-existent actuality of my actual experiencing and insofar falsify what I actually am.

From the point of view of the logic of object-thinking the immediate self is, therefore, irrational or incommensurate. In and for itself it is absolutely singular and unique. It exists once and never more than once. But at the same time it is universal, in the sense that it pervades all other concepts and experiences with its ineluctable presence. It can not be stated in any general terms, in which alone the logic of object thinking can move; there is no science of individuality, but all contents and degrees of object thinking must be carried and actualized by myself. In thinking this very proposition I may think a universal truth, but as my I-existent state of mind now this proposition is just as absolutely singular as is the headache which I also may feel right now.

Not only from the point of view of logic is this immediate self irrational, but ineluctable; it is also irrational from the point of view of general moral or legal norms. I am never identical with the person which signs the contract or takes over an obligation. Its living singularity, uniqueness and unrepeatability defies the rational and calculable connections of social-cultural systems. But they, on the contrary, could not be and would have no meaning, if they did not live as the meaning of myself and in myself. They are dead and irrational in turn, if no one carries, stands for them, lives in and dies with them.

I am one with this-here-now immediacy, and I am not one with it because I can refer to it, think it as this irrational subjectivity. As other than my thought but as content of my thought, as refusing to be rational but as necessary for my rationality, it is a part of myself but not identical with myself. When I emerge from my dreaming or my daydreaming, I distinguish myself from this flickering manycolored state of mind, which on the other hand I can not disown. I am not found among the momentary impressions and reactions, but I am not found apart from them either. I am never experienced or given, but experiencing and giving is inseparable from what is experienced and given. I am temporal flux through and through, but the self maintains its unity as an embracing whole of all its rhythms.

So far we have tried to analyse human nature in its immediacy, as it can be thought in that indivisible totality and singular uniqueness, which we call individuality. And we still do not leave

this realm of simple purposeless being-there, of unmediated prerationality, when we consider this same individuality in its immediate responses and contacts with others. All its manyfold functional activity is at the same time reactivity. Immediate life is constantly in a state of alertness or alarm, in a turbulence of excitements through external images, inseparable, as we have seen, from vital experiencing. This enhances the irrationality of the individual in its immediate existence. The individual finds it impossible to find its own limits, while clear limitation and definition is the beginning as well as the end of all abstract rationality. No line can be drawn between the individual and its idea, between the reactive self and the image exciting his reactions. Through this reactivity the individual is interfused with the whole complex of shifting and drifting environmental changes. What is my own and what is the color and reflex of my environment? How can I become aware of this coloring in my immediacy? The question is unanswerable from the standpoint of the immediacy of existence. Our reaction is inseparable from passion (*passio*); we suffer our excitements and are their victims.

This blend of doing and suffering, of fear and fascination, is the essence of idolatry. In our immediacy we are all idolatrous. Every idol is an external image evoking passionate responses invested in the idol itself. The rationalism of the Enlightenment thought we had overcome idol worshipping, because its sense for our immediacy was weak; but this blindness for a real side of our existence prepared the way for idolatrous passions and passionate idolatry. Idols are the more powerful as their worshippers and victims are unaware how they are beholding their reactivity in the seemingly external image. To recognize immediacy and its dialectic is to cure its dangerous isolation.

Analysing this identity of the opposite passions of fear and fascination further, we see that the function to overpower, absorb, or subject the other to yourself is dependent on the ability to adapt and assimilate yourself to this other. If I sneeze because my membranes carry on an illegitimate intercourse with the love life of grasses, this is at once as much adaptation as allergy, identification with the other as well as violent protest against it.

The incalculable functionality of the immediate clash with the

world produces on a higher level what we call psychological consciousness. It is an alertness, at once full of alarm and of a will to maintain oneself, a momentary and present "I think" in this collision of events; this psychological consciousness is like an electric spark when a wire is torn, symptom of a danger which makes it expedient to be alert and awake.

Mob passions and mob hysteria are the result when many individual passions are multiplied and aggregated. They infect each other without producing a higher rational or mediated unity. On the contrary, protected by many, the individual feels assured in his irrationality. His selfidentity is lost, a "deception of nature".

It is an ironical outcome of the rationalistic trust in mechanisms, machines and machine production, that large masses have lost their anchors in moral and cultural orders of life and are set adrift. The machine age has created conditions favorable to the multiplication of cohesive and infectious incoherences. Its own defective vision of humanity as a rationalistic and calculable arrangement of "human resources" has brought about its own formidable opposite. The prevalent interest in all contemporary arts and many sciences in the "primitive" testifies to the immense strength and resurgence of irrational immediacy.

IV. ORGANIZATION. Dissatisfaction with immediacy betrays a practical-moral conception of man. Practically, I become myself in wrestling with the other, the Not-I-Man, as practical organizer of life is like the gardener, who weeds out what displeases him, makes plants grow in rows and trims hedges into shape. Practically life is a struggle, a perpetual hurdle race. It becomes reflective through the disappointing experiences that others limit my naïve desire of selfassertion. I learn to measure myself in the living mirror of resistance which the Not-I offers me. I become subject and master of my actions in this test of power. I cannot find out coolly and theoretically what this other, which I meet, is: "the test of the pudding is in the eating". And I also become myself, I find out who I am, through experiencing the Not-I. My inwardness is mediated by externality, practical existence lives in tensions.

Man, however, transfers this practical situation into his own self. His relation to an external other, becomes at the same time a

relation within himself. Man splits himself into contending parties and also establishes himself as the judge of his own parties. He thus becomes a society in himself, the only place where society is lived, where society is existential. Social tendencies, being also my tendencies, are loved and feared as my own possibilities or temptations. Success and defeat with reference to others, are also my own success and defeat, and *vice versa,* the experience I get in shaping my own tendencies, will also determine whether I am confident or diffident, "optimistic" or "pessimistic" with reference to the chance of external changes and improvements.

Naïve "optimism" of selflove is primary; naturally, everybody would like to believe in himself and in his irresistible luck, but nobody escapes sobering experiences. The external world may be "in his way", or the self may be in its own way, and man may begin to hate the self that has dissappointed him. To compensate or overcome this feeling, either demands and expectations are diminished or martyrdom is welcomed to prove that the self not only can "take it", but also can "dish out" misery, and so prove his mastery over it. Many selfhaters turn to others hoping they may save them from themselves; they regain their lost confidence by abandoning themselves to their saviors or find approval and support in a "social movement". Or they turn furiously against "the system". Someone must be "the goat", someone must be responsible for my failure, for otherwise I could not endure myself. Selflove, on the contrary, will also love the self in the other, because it is sure of the value which lies in being oneself. Neither selfhate nor selflove exists in purity. The practical selflove is a problem to itself and therefore needs selfknowledge.

In philosophy, practice is understood as dialectical dualism. In organizing my experience I am the object of my own demands. But as object of myself I also object, and the borderline between the demanding and the resisting self is as fluctuating as the border between states at war. I can be practical self only in overcoming myself. I at once want to be one and not one with myself. In demanding unification of experience I also do not want this unification to take place, because if I were successful then I would have nothing left to do. I would cease to be as a practical self. My demand creates and perennially maintains that which does not

live up to my demand. Only when I want order can I be dissatisfied with disorder, the demand of cleanliness discovers dirt, the demand of love reveals how unloving the world is, law establishes crime, efficiency makes laziness objectionable, and so on. The demand makes for and establishes its own negation as that which is to be negated.

The practical-moral organizer is not aware of the dialectical truth which is his own reality. He only experiences himself as a house divided against itself. But in spite of this regrettable experience, which he makes with his standpoint, he remains undismayed, keeps on hoping for final victories, because he can not see through his dialectic and understand that the strange obstreperousness of experience is of his own making, is nothing but the embodiment of his own mode of existence. He must stubbornly insist that his other self be subjected to the organizing intention of the self responsible for his demands; but, on the other hand, he cannot fail to experience reality as a caricature of his good intentions and of the law of his heart. Thus, practical man can never unreservedly approve of himself. He can neither let go of himself as his partner, nor can the partner be identified with the commanding subject, because of the regrettable and strange experience which the subject makes with his partner.

We noticed that practical organization and pragmatic self-knowledge arise as a protest against the irrationality of immediacy. This origin taints all organizing intentions with the very subjectivity which they set out to correct. We are negatively fascinated by our opponent. Individuality shall be educated and expanded, change shall be stopped, the momentary shall last. And since all such intentions are incapable of final triumphs, the practical will lives in constant anxiety lest it be overpowered by distintegrating contradictions, denials, lack of loyalty and cooperation. And worse than that; even where organization has been achieved, such embodiment of the practical will has not left the sphere of the immediate subjectivity which it tried to overcome. What seems important to me or my tribe must be important to all, but this is always an illusion. Every attempt to achieve unity and wholeness through practical organization is bound to remain selfcontradictory.

Plato was the first to show in his *Politeia*—and no distance of time and no dust of "progress" has dimned the luminousness of his picture—how the state illustrates the dialectical truth of all practical organization of life. The leading, executive, and central will of this "individual writ large", whether represented by one or many individuals, stands for the will of the whole state. The executive presents and symbolizes the intentional unity of all. All who participate in this unifying organization are one with it, are members or citizens. But insofar as they also follow their own particular and individual interests, they are suspect as "idiotes". To the leading and responsible will they appear as resisting objects to be brought in line by education, persuasion, or force. The state is not viable without this power of coercion, which shows that it is always a questionable achievement. But whereas the state is thus a tension inside, with reference to outsiders and other states it appears as a united people. Seen from this other and outside, the agent responsible for the state's action and its citizens appear as one functioning whole. Confronted by an enemy, internal dissentions recede. War is a test, a final examination, whether the uniting and directing will has actually succeeded. The many, objects of education internally, are united as subjects of united action externally. I, the practical organizer, I the state, experience myself both as united with my partners, and suspicious of my partner as a possible "subversive element". I am both one with myself and not one with myself. The incapacity of the practical self-experience to see through its own self-created dialectic is reflected in the state's humorless inability to see and to admit its own subjectivity. It projects its own practical estrangement into the image of the opposing object of its will.

Man can not be human without participating in that same practical organization of life, which also plunges him into his tragic destiny. Man needs this hard protective shell to live in his own human fashion; were he to throw away his fetters, he would also throw away the possibility of humane values. But to affirm the practical dialectic, to participate in it with humor and without bitter cynicism, he also must be philosopher enough to recognize the limitation of this aspect of being human. Practical life is not the whole of life. If man loses this philosophical reserve and

relaxation, he is likely to drift away from the center of the practical process, in which he must maintain his practical self, and lose himself in extremes. He will either become ridiculously efficient and athletic, always overrating future possibilities, always confusing his intentional unity with what actually is, always hoping that his plan, his good cause, his law will prevail for the general moral salvation of all mankind; or he will overrate, on the contrary, the inevitable disappointments of actual experience, despair over the miserable and weak empirical environment and "material" he has to work with, lose his enthusiasm in a philistine defeatism, placing infinite value on trivial things and achievements. Sentimental utopian illusions forget the actualities of practical life in a glorious future, while equally sentimental reactionary illusions minimize the present in favor of a glorious past. Both lose the practical grip on life, because both affirm the practical standpoint without realizing its inherent dialectical struggle. If all avenues of escape are blocked, if it is clear that one cannot be practical without also shouldering the guilt and the limitation inherent in all practical organization, if it is admitted that obstacles are there to be overcome, but that this practical situation is there for good, then it also is inevitable that the limitation of this whole dimension of man be acknowledged.

V. NIHILISM. Nihilism is the philosophy of despair. Man despairs of finding his true self; he thinks of himself as an onion with many leaves and no kernel. Fundamentally, nihilism believes with moralism that the true self is identical with his practical organization, but believes it negatively; because the self as practically organized is not the true self, therefore there can be no true self at all. The disappointment brought about by observing the practical selfcontradictions becomes a standpoint.

Desperate man finds the price for his practical organization too high. He argues that the organizer loses his true self or can never find it, because he gives it away to an objective embodiment, which is not a self at all. The care for such objective organizations plunges man into misery and prevents an unbiased and harmless intercommunication. Worthy causes, he argues, are carried out by unworthy means and depend on stupid circumstances. Organization calls for counter-organization and makes meaningless conflicts

inevitable. Objective obligations, duty and conscience are demasked as selfcontradictory and merely subjective. And all organizations of life are ultimately finite and doomed to death and oblivion.

Romantic nihilism is disillusioned smartness. In a world where everything is relative and arbitrary, everything is allowed if you can "get away with it". As historistic relativism, it revels in the game of playing one value of the self against other contradictory ones. It points out that all selfrealizations are tied to symbols or vehicles, which lose their compelling majesty when faith leaves them and can be had cheaply at an auction. What was genuine symbol in history becomes a sensation for tourists. Romantic irony parades in brilliant feathers of the past, whose riches are exploited but never assimilated; it is always smarter than what it talks about. And everywhere it suspects the same insincerity and lack of substance, which it is. Culture is explained away as superstructure of material interest, and God is nothing but an image of a miscarried sex life. All moral-practical organizations are denounced as false fronts hiding particular interests, while particular interests are bemoaned as irrational and arbitrary. But the irony, which overtakes this romantic irony is this, that where everything is allowed, everything is possible—and so it is quite possible that a despotic and ruthless activism will impose its organization on a culture which is entirely undermined and emptied of founded convictions and values. When practical organizations have lost credit and confidence, they will have to restore their unavoidable necessity by coercion. And this, in turn, may justify a more radical nihilism.

This romantic and mundane nihilism is superficial; it does not see man, but only individuals and their congeries. A more searching, more central and thoughtful nihilism contemplates the absolute limits of organized man in suffering, death, struggle, and guilt. It confesses the lack of human wholeness and teaches compassion. It deplores the selfdestruction and the blindness of limitless practical man.

Existence is suffering because it is mortal. No achieved value endures in experience. The relentless destruction in nature, the pains of sickness, the sorrow to lose beloved ones, the anguish to see them tortured without power to relieve them, the annihilation of a culture, the fear of death and insanity, the frustration of

good will—all such crucial crises are flashlights of the truth, that practical experience as organized embodiment of will is limited. Suffering is implied in the will to live, in the desire to possess your embodiment. And such will and desires are symptoms of a lack of wholeness and finality, they point to negative conditions evident in needs and wants, which clamor for satisfaction. All action is thus a removal of such negative and threatening conditions, it is nothing positive in itself. Man wants to experience himself, but what he gets is an embodiment of his emptiness which is rightly destined to suffer and to die.

At this point, mundane and metaphysical nihilism come into conflict with each other. Epicurean and Stoic philosophies of despair and of resignation argue that death is not real, because it cannot be experienced, neither by the living for whom death is not yet, nor by the dead for whom death is no longer. The fallacy of this argument lies in the assumption that the real is only that which can be experienced. Death is real as limitation of experience. The annihilation of one's own embodied self has a total character for one who identifies the self with its embodiment or practical organization. The pragmatic self, identifying the true self with its organized existence, posits its absolute limit in death. And this limit is evaded if a continuation of pragmatic existence is postulated in a wishful immortality.

Existence, thirdly, is conceived as a hopeless struggle. Not hopeless in the pragmatic experiential sense of having your victories, but in the sense that no such empirical victories are final; they do not alter the fundamental rootedness of practical existence in a brutal struggle. Every existence fills a place which would be coveted by an other if it were vacated. All practical culture, therefore, is filled with anxiety and care to hold such positions against rivals, intruders, intriguers. Mutual support of cliques, clans, guilds, organizations thus builds in this world of practical experience units of higher power to battle among themselves. Any existence which would practically deny this "war father of all", which would evade the struggle as a condition of its being-there, would eliminate itself. It may close its eyes to this limitation of practical experience only when it enjoys a powerful and secured position won for it by the struggle of others. The hypocrite then pretends that existence without struggle is possible; such liberal

pacifism wavers inconsistently between an artificial "good fellow" attitude and lamenting inconsistency, while the utopian deceives himself when he thinks that struggle is a means to get rid of all struggle. Struggle is a necessary evil and limitation of all fixed and settled empirical finalities.

Guilt, finally, is just as unavoidable for the practical self-experience, as suffering, death, and struggle. Law, order, practical rationality imply and posit lawlessness, disorder, irrationality, by which they are affected and in which they inevitably become embroiled. Man pays his price for his practical organization by becoming dependent on an irrational and contingent world, so that he can never disclaim his guilt when his action has consequences which he has not foreseen. To avoid guilt he would have to be absolute master of his actions and their effects, but his actions are always conditioned. He inherits the guilt of the fathers. To deny the necessity of guilt for practical life would be guilty itself, guilty of an irresponsible and untrue megalomania.

With man inextricably involved in guilt we have reached the religious conception of man as sinner. Nihilism leads to religious self-knowledge. "To be a philosophical skeptic is . . . the first and most essential step towards being a sound and believing Christian".[3] The moral practical sphere of existence is sin, if man attempts to absolutize himself by his athletic efficiencies and moral virtues. This is the radical evil, the perversion of reason in promising man he will be like God, while in reality much promise leads to conditional finite ends falsely absolutized. The deification of state and race are examples. But no human practical self-embodiment or experience can be good: *Non posse non peccare.*

The nihilistic discovery of absolute limitations of the practical-moral self implies a pure self which can endure and outlive suffering, death, struggle, and guilt, and which thus emerges victoriously out of the selfcontradictions of moralism. Man can only find himself in transcending himself. The true and good self is found in the complete and unconditional surrender of all human self-will. The unconditionally good will is the disturbance of all human goods and assurances.

Man's goodness lies in his being God's creature, not in himself. He can only bring his self as sacrifice, as Abraham sacrifices his

[3] David Hume, *Dialogues Concerning Natural Religion*, end of part XII.

moral self by wanting to murder his son and as Jesus gives up his will on the cross.

But this religious transcendence is paradoxical on two counts, in itself and in its relation to morality. It is paradoxical in itself, because God creates the world as good, he is the transcendent ground and unity of all confused worldly processes; but God is also the "son" come to suffer and to die in flesh, confirming suffering, guilt, and death as his own will, and as Holy Ghost he is the unity of his own disunity. The religious community, accordingly, confesses its sin and this sin is forgiven, but it nevertheless also continues to pray for this forgiveness and that the "kingdom come". Christ reconciles human nature to God by sacrificing it, nevertheless a "second coming" is to be hoped for.

In relation to morality, man seeks religious peace because he is tormented by his own self-willed moral war, but in his confession and prayers he nevertheless confirms this insufferable condition as his own essential self. The religious condemnation of the "pharisee", the moral pillars and practical organizers of state and church, is affected by what it condemns. The attempt to supplant the state by religion leads to a new organization, which behaves as if it were a state itself. The saint may have emancipated himself from all earthly "fathers and mothers", he has dissolved all legal-moral obligations of finite purposes, he has reached his metaphysical home which has room for all. He embraces all in a religious love which disregards absolutely whether individuals are worthy or unworthy, important or unimportant, intelligent or unintelligent in the estimation of the world. But he must nevertheless deplore and pity the unregenerated man who is worshipping himself. The practical moralist, in turn, suspects the saint of being resentful against moral culture and human worth. Religion, in his opinion, protects and protracts human injustice by being indifferent to moral-social-political distinctions and necessities. He despises in the saint that lack of plastic-objective personality achieved in moral efforts of self-improvement. This tension between moralism and religion is an ineradicable dialectical relation in which either pole would be incomplete without its opposite.

The paradox is projected into the religious image-thinking. "Our father in heaven" joins two images taken from social and natural experience. But they are not to be taken literally. "Father"

and "heaven" unite the feeling of trust and dependence with otherness and remoteness. The "new Adam", "the new heaven and earth", and so forth, all express the radical protest against literal and human politico-social conditions and plans of reform; but they all use the image of the thing which is to be abandoned. The image of the resurrection states the overcoming of the natural categories of space and time in spatial-temporal images. Religion finds "eternal peace" and "immortality" in the divine self, had and referred to in images that do not want to be images. Religious symbolism thus reflects the oscillation of the self which wants and does not want to transcend itself. Religion wants freedom from the self, but only in order to receive it back again, as Job received all his embodiments back with rich interest. God's revelation breaks through this refractory medium of our practical interests, with which we are obsessed, in terms of this very medium. "We see through a glass darkly".

The dialectic of the religious image agitates religious consciousness. On the one hand, the image, because it seems definite and what is vulgarly supposed to be concrete, is a uniting bond, a sign in which to win. It establishes positive and traditional churches. On the other hand, for the same reason the image disunites and splits the religious unity, which ought to be absolute, because images are external and may, therefore, be understood and misunderstood in various ways.

Mysticism, therefore, attempts to establish an imageless religion. It is the passage to philosophy. It thinks the unity of the divine with the human self through the annihilation of all separating images. Man the mystic finds his inner and essential self as pure activity, which can not be objectified, and he finds God by denying all attributes taken from experience. God has no obstacles or temptations to overcome, he does not plot and scheme, he is neither wise nor morally good, but he simply is.

Art, on the contrary, develops the mythical imagination in the direction of pure immanence. Man realizes himself in the world as image, as a pure spectacle and mirror of himself. His real self and pure appearance coincide. Art uses natural and practical images and makes them speak the language of the self. Life, regardless of its moral or immoral qualities, is good to behold. Its appearance is an innocent totality. Thus the unity, totality, and

harmony of the true self is reflected in the unity, totality, and self-sufficiency of the work of art. Man celebrates his reconciliation with the otherness of his experience in this symbol.

But this reconciliation too does not escape dialectic. The artistic image seems to be an object, but really it is a derealized or idealized symbol of the self; as such it must be actualized by the artistic imagination and is not present to the senses. On the other hand, it seems to be expression and self-revelation of man, but really it is only a dead surface, a shadow and a show. In art also man is one and not one with his own other. If this limitation is disregarded we get an aestheticism living in a mirage, as Kierkegaard has demonstrated. All levels and polarities of the self may be blended in a great imaginative symbol, but this symbol itself remains only a partial and irresponsible aspect of human existence. Man is degraded into a Narcissus when he falls before the temptation to mistake the ideal image of art for his real self.

VI. DIALECTIC. Philosophy reflects on the meaning of human existence in this world, and the meaning of human existence is reflected in it. It has no other purpose than to think what is, or to serve the truth. It is self-knowledge and self-realization in the medium of reflective reason. Its logic is dialectic, its unity is not outside of or apart from the various conflicting culture mentalities. It is in them as their difference and it is in them as their unity. Oneness is not thinkable apart from otherness, unity from individuation, being from becoming. Philosophy is not a special sociological profession; it only appears so when you erroneously think that you do not participate in it, when you look at it from the outside—which can not be done. Philosophy is not an object which can be looked at, it is concreteness of life in universal form.

In contemplating the experiences which the self makes, philosophy limits them in the simple conceptual form of thought. It is never domineering or acquisitive, because such experiential modifications of the self are understood in their limitations. All experience the self can make, including self-experience, is always experience of an other, of an embodiment, of a self-alienation. Dialectic thinks these nonlogical forms of life in their partiality; it is the rational formulation of the irrational. "Love your enemy" is dialectically understood as religious paradox; the enemy is

understood as necessity of practical-political thinking; but truth itself knows no enemy.

Experience is the source of all errors and illusions, because it can not understand itself except in terms of its object, in the mirror of the Not-I. The economic man, for example, understands himself in terms of calculating exploitation and clever adaptation; the social man understands himself in terms of communal joviality; the scientist, in terms of rational rules and conscious decisions; the politician, in terms of power, conquered obstacles, vanquished enemies; the aesthetic man lives on impressions furthering his organic growth and his need of charms; the religionist experiences himself as a battle ground of sin and grace, temptation and providential guidance. All are philosophical when they understand the limit and value of such experiences in the self-becoming totality, which is man.

All great philosophers are agreed on understanding this totality as a totality of hierarchic levels and as a unity of opposites or polarities. Examples: Plato's Belief, Right Opinion, Knowledge; Aristotle's Passive, Active, Divine Intellect; Plotinos' Body, Soul, Mind; Meister Eckhart's Material, Practical, Contemplative Life; Spinoza's and Leibniz's Confused, Clear, Adequate Idea; Kant's Perception, Intellect, Reason; Hegel's Consciousness, Self-consciousness, Spirit; Sorokin's Sensate, Idealistic, Ideational Culture. Man is all of this, always. But in his history he slowly turns from one pole of his complex nature to an other, and his arts and sciences, his social organizations and beliefs follow the change in his metaphysical orientation, of which they are institutional and traditional embodiments and shadows. History is the experiential verification of philosophy.

On the level of immediacy the self is one with its individuated and singular becoming, with the coming/going, appearing/disappearing This-Here-Now. Object-thinking splits experience into an external, sensuous, meaningless, ununderstandable, self-less nature; and an I-existent, psychical, meaningful, understandable culture. This subject-object cleavage is the sphere of scientific and moral practice, which believes in law, order, and system to bring "nature under control", and to unify and stabilize experience. On the third level the self breaks through the biological environment and through particularized subjective-practical worldviews. To the

universe as a whole corresponds the self as existential thinker.

Dialectical thinking now embraces the subject-object polarity with the scientific-practical tensions, as well as the level of immediacy as self-differentiations of the whole of life, and also recognizes itself in the symbol of art and religion. It knows that this whole can neither be experienced nor willed, because it is itself in and through and in spite of all experiential perspectives. I-thinking finds in the other the same being and the same unity which it is as existential thinker. This unity and solidarity in being must not be confused with the practical-moral solidarity in pursuing a "cause", illustrated in the state, because that moral-political unity is programmatic, exacting, and critical, distrustful and reserved with reference to its partners and hostile to its opposition, which it engenders. Nor must this unity be confused with any achieved or conscious unity, because it is the eternal Now in my experiential before and after, and in my existential past and future.

Man, we said, is not only a hierarchy of levels, he is also a unity of polarities, a living nexus of contradictions. He lives in a restless movement, wherein every achieved resting-place, including that of the skeptic, is called in question, wherein every position contains its opposition and the seed of its limitation and destruction. It is the one life of man which seeks forms and protests against them. Irrational immediacy lives in protest against moral, legal, teachable systems; and the rational will, in turn, is protesting against the unity and totality of being whose dialectical articulation he slanders as indifference to his ideal and important concerns.

Man, nevertheless, loves to find out what he is. His true humanity lies in this power of reflection. In his divine madness he makes his own appearing individuality the vessel of the eternal. In this enthusiastic self-creation he risks his whole self. The more the universe discloses itself as that one and invisible and indivisible totality, consciously present nowhere save in I-think, the more is the self of man an ever growing focus of many dimensions. And the better the self thus knows itself, the more questionable and uncertain it appears. To embrace in the questionable individual the absolute, is what Plato calls Eros, love. Man's true self is Eros.

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DISCUSSION

THE DIFFERENT KINDS OF A PRIORI

I AM going to distinguish three kinds of *a priori:* the *formal* or analytic a priori, the *functional* a priori, and the *material* a priori. With these three kinds of a priori there are associated three types of *necessity:* formal or *logical necessity,* as characterizing logical truths, whether the latter be called *tautologies,* as by logical positivists, or "truths of reason", as by *Leibniz;* functional necessity (Aristotle's "hypothetical necessity"), predicable of conceptual means in relation to objectives or ends of inquiry; and the kind of necessity that one might call psychological, if it were not the case that the chief proponents of this kind, the kind of necessity that is traditionally defined by *self-evidence* or the inconceivability of the opposite, are explicitly opposed to "psychologism" in logic (I am referring to the school of phenomenology, or "Gegenstandstheorie", as founded by *Husserl* and *Meinong.*)

I

Kant defined an analytic a priori judgment as a judgment whose predicate forms part of the meaning of the subject. I am quite aware that this is not what Kant literally said. Kant said, in order for a judgment to be analytic, the concept of the predicate must be *contained* in the concept of the subject. This formulation is to be avoided, however, because it lends itself to a psychological interpretation, and as a matter of fact in some passages Kant uses explicitly psychological language, as when he says in the concept of body we already *think* the concept of extension, and *therefore* the judgment "all bodies are extended" is independent of experience.[1] Seizing upon this ambiguity of Kant's terminology, philosophers have since argued that the distinction between analytic and synthetic, as formulated by Kant, is purely psychological, such that the analytic or synthetic character of a judgment varies with the context of its utterance and cannot be determined apart from that context. Indeed, if the analytic character of a judgment is defined by the fact that we cannot think of the subject without thinking of the predicate, then the *formal* a priori would hardly be distinguishable from the *material* a priori, defined by the inconceivability of the opposite.

The formal a priori, then, is not to be defined by the *psychological*

[1] It should be mentioned, though, that in the paragraph entitled "Of the highest principle of analytic judgments", in the *Critique,* Kant improves on his initial definition of "analytic", by giving a purely *logical* definition in terms of the principle of non-contradiction. (Translations from the German are by the author, unless otherwise noted.)

predicate "inconceivability of the opposite", but by the *logical* predicate "self-contradictoriness of the contradictory". "A is B" is analytic, if B forms part of the definition (and *meaning* in this *logical* sense only!) of A, such that "A is not B" reduces to the contradictory judgment "XB is not B", where X stands for the rest of the defining predicates of A. Such a definition of "analytic" is not exposed to the objection of psychological relativity. For one defines a term—thus converting a floating representation or image into a fixed *concept*—just in order to render its meaning invariant with respect to the psychological idiosyncrasies of the people who use it. Also, one cannot say that one and the *same* proposition may be taken as analytic or as synthetic, according to the stage of inquiry and the acquired knowledge of the judging person. For if the predicate B forms part of the meaning of the subject A, the *concept* denoted by A is different from the concept denoted by A when B is not definitory of A; hence the respective *propositions* are different, although the verbal *sentences* are identical. (A proposition may be said to be a *logical* entity, which has neither physical existence, like a sentence, nor psychical existence, like an act of judgment; it is the "Sachverhalt" expressed by a sentence.)

A "realist" would presumably say that to escape from the psychological relativity of logical necessity by substituting for the thought of the concept the conventional definition of the concept, is to fall from Scylla into Charybdis. If the logical necessity of a proposition depends on the way we define the subject-term, then logical necessity has an extralogical origin. By merely changing the definitions of our terms, we can destroy and create logical truth; and this kind of relativism is just as detrimental to the dignity of logical truth as the psychological relativism it is intended to amend for. Must we, then, say that "A is B" is logically necessary, only if B forms part of the *real* definition of A?

This, indeed, seems to correspond to Kant's meaning. Surely, Kant could not have insisted that extension is a defining attribute of bodies while weight is not, if he had recognized the conventional character of definitions. Psychologically, there is no ground for regarding the feeling of pressure or resistance as secondary, and the sense of extension as primary, in the formation of the concept of matter. For the Cartesian school, extension was the essential attribute of matter, in the sense that dynamics was considered as reducible to kinematics and kinematics to analytic geometry. Within Newtonian physics, on the other hand, force is a fundamental concept; masses are idealized to such an extent that they are treated as points, and what constitutes them as *physical* rather than *geometrical* points is not that they have extension, but that they are subject to gravitational forces. In this context, therefore, weight would seem to be

more essential to masses, than extension.[2] Kant, then, must have distinguished *the* concept of matter from alternatively definable concepts of matter. In Aristotelian fashion, he must have made an *ontological* distinction between essential and accidental predicates. As Locke distinguished between "real" and "nominal" essence, so Kant distinguishes, in his lectures on formal logic, between "Realwesen" and "logisches Wesen". Only the latter is relative to the selective definitions of the inquirer, while the former is absolute, something to be discovered. It is, indeed, true that for Kant not only empirical substances, "material archetypes", are "Realwesen", but also the genetically or synthetically defined concepts of mathematics. But such "synthetic" definitions are, for Kant, not altogether arbitrary; they are subject to the laws of "pure intuition". That the straight line is the shortest distance between two points, is, within the domain of *pure* intuition, just as good a *discovery* as the solubility of gold in aqua regia is a discovery in the domain of *empirical* intuition.

Every definition is conventional in so far as it involves *selectivity*. It is no longer possible to ignore the *pragmatic* element in inquiry, and so far one cannot believe in Aristotle's "real" definitions. At any rate, one cannot base the *formal* a priori on necessities of the intuitive kind, like Aristotle's intuitive discrimination between "essence" and "property", however considerable a part pure intuition may play in the domain of the *material* a priori, the a priori of the phenomenologists. As *Dewey* has shown, " 'substance' is a logical, not an ontological determination". That is, "essential" predicates cannot be defined as standing for "inherent" properties of independent, "given" substances, without reference to the objectives of inquiry; they are to be regarded as predicates *selected* as definitory of a concept. For logic, in other words, substance is always a "logisches Wesen", not a "Realwesen"; "essential" predicates are *definitory* predicates, and if we select different predicates as definitory, the "substance" will be different. The analytic nature of a proposition, therefore, must be recognized as independent of whether the definition of the subject-term be "real" or "nominal". It is quite true that a definition of a term already in use presupposes (in the genetic order) in most cases—or perhaps always—a *synthetic* judgment. If the term to be defined had, *e.g.*, already a denotation or extension, the definition will formulate the *discovery* of a common property of the *denotata*. As we shall see later, it is highly important to recognize this genetic

[2] Historically speaking, though, Newton and Kant are in the same boat, in that they both distinguish, in scholastic manner, *essential* predicates from *empirically universal* predicates; for Newton, as for Kant, weight is, though empirically universal, not an essential predicate of matter (cf. Cassirer: *Das Erkenntnisproblem*, II, 679-80).

dependence of analytic truth upon synthetic truth (*cf.* Kant's statement: "Where the understanding analyses, there it must first have synthetized, because it is only as synthetized by it that anything can be given to the faculty of representation." *Critique of Pure Reason*, ed. Cassirer, 113). But hence to infer that there *is* no such thing as a purely formal or analytic a priori, would be very confused indeed. Whether a proposition of the form "A is B" is analytic, depends on the definition of A, no matter what be the *reason* for adopting just that definition. And in so far as definitions are conventional, analytic truth or logical necessity is, in part,[3] conventional.

No state of affairs is logically necessary or logically impossible, a priori the case or a priori not the case, *per se*, but only *relatively* to definitions. In so far as definitions, provided the terms that occur in them have empirical reference, may themselves formulate synthetic, empirical truths, it does not seem to me to be fortunate to say, with the logical positivists, that a formally a priori sentence "says nothing about the world". In the procedure of science empirical laws are used for the definition of its concepts. For example, mass is defined in terms of Newton's third law (*cf.* Mach's *Mechanics*, ed. Brockhaus, Leipzig 1908, p. 231), or heat-capacity in terms of the principle of the conservation of the quantity of heat (*cf.* Mach's *Waermelehre*, 186-188), or internal energy in terms of the first law of thermodynamics. Of course, once an empirical law has been adopted as an implicit definition of a concept in terms of which it is stated, it ceases to be a contingent truth and becomes, *qua definition*, irrefutable by experience. All that can happen is that future experience will call for revision or abandonment of the definition. But the reason for such a change of convention is itself a non-conventional state of affairs: it is the fact that the empirical law corresponding to the definition fails to be verified. Provided this concomitance between change of convention and change of empirical truth, between changes in the "meta-language" and changes in the "object-language", is recognized, there may be no harm in maintaining that what is formally a priori, in the sense of being definitional, says nothing about the empirical world; and we have ourselves insisted that, in order to determine whether a given proposition is formally a priori one need not inquire into the reasons that led to the adoption of just *that* definition of the subject-term. However, neglect of such genetic considerations easily leads to a futile separation between *logical* and *causal* or empirical possibility. If science defines its concepts in terms of causal laws, then causal possibility or impossibility is itself the

[3] The import of the qualification "in part" will become manifest in the discussion of the *material* a priori. It is meant to indicate that logical necessity depends on definitions *and* principles of logic, the latter being themselves not *formally* a priori, since the formal a priori is defined in terms of them.

raison d'être of logical possibility or impossibility. If mass, *e.g.*, is defined in terms of the dynamic relations expressed by Newton's third law, or by the law of gravitation, then it will be causally impossible and *therefore* logically impossible that only *one* mass should exist. Only if logical possibility should be defined in terms of the *psychological* concept of conceivability, could such a state of affairs be maintained as logically possible. One certainly can perform a "Gedankenexperiment" to the effect of picturing just one mass and nothing else in the world. But the pictorial or phenomenal meaning of terms must be distinguished from their conceptual, relationally defined meaning.

We have so far arrived at a definition of the formal a priori which renders it independent of both psychological context and metaphysical presuppositions like Aristotle's concept of "real" definitions, based on the distinction between "essence" and "property". It is furthermore desirable to render it independent of the subject-predicate schema of Aristotelian logic. The standard form of analytic truths is formal implication; as *Leibniz* pointed out, the "truths of reason" are always *conditional* in character. In many cases it is, indeed, possible to translate a formal implication $(_{(x)}[\varphi_{(x)} > \psi_{(x)}])$ into a categorical A-proposition of subject-predicate form (every φ is a ψ). But such a translation easily leads one to overlook the non-existential character of analytic truths: φ and ψ may define null-classes, while the relation of subsumption, in Aristotelian logic, holds between *ontological* classes. That the Aristotelian logic of subsumption was not *formal* at all, is evidenced by the fact that subalternation is, in Aristotelian logic, a valid mode of immediate inference. If A-propositions are formulated in categorical form,, then, indeed, subalternation seems to be valid; if the classes defined by φ and ψ are interpreted *extensionally*, then a mere inspection of the *meaning* of the A-proposition "all φs are ψs" induces us to draw the inference: "some φs are ψs." But, from $(x)\ [\varphi_{(x)} > \psi_{(x)}]$ it by no means follows that $(E_x)\ [\varphi_{(x)} \cdot \psi_{(x)}]$; "constant conjunction" cannot be inferred from "necessary connection", and the above formal implication may, though it need not, express a "necessary connection". Again, the existential or ontological assumptions implicit in Aristotelian logic are transparent in the so-called square of opposition. As *Meinong* (*cf. Ueber die Stellung der Gegenstandstheorie im System der Wissenschaften*, 43) points out, the negation of the particular negative may be *formally equivalent* to the universal affirmative; but in so far as the universal affirmative expresses non-existential knowledge ("daseinsfreies Wissen"), while a particular statement is about existents, it cannot be said to be identical in meaning (in a non-formal sense of "meaning") with a particular statement. According to Meinong's "Gegenstandstheorie" we must distinguish between the "Objektiv" and the "Objekt" of a

judgment. The "Objektiv" of a universal necessary judgment (I disregard, for the moment, the fact that the kind of necessity which Meinong talks about, is the necessity of the *material* a priori, which will be discussed later, not the necessity of the *formal* a priori) is non-existential; the universal necessary judgment is not concerned with empirical objects at all. The meaning of the judgment "all equilateral triangles are equiangular" is not: "there do not exist any equilateral triangles that are not equiangular"; for we come to deny an existential judgment, whether affirmative or negative, by examining *instances* and finding that a certain conjunction of traits does not hold in any one instance. But the above universal proposition, using *Dewey's* terms, is not a *generic* proposition: it is not about a conjunction of "characteristics", but about a connection of "characters". For the purposes of formal logic, indeed, a universal affirmative may be said to be derivable from the negation of the corresponding particular negative by a mere syntactical transformation: $\sim (E_x)\ [\varphi_{(x)} \cdot \sim \psi_{(x)}] >_{(x)} [\varphi_{(x)} > \psi_{(x)}]$. But this transformation is possible only because the symbol '>' in the implied statement, stands for extensionally defined *material* implication, the logistic analogue of Hume's "constant conjunction" (in respect of the absence of logical necessity). If the implied statement, however, is *analytic,* expressive of "daseinsfreiem Wissen", the above implication represents an idle syntactical rule that is of no use in the drawing of inferences: no mathematician would attempt to prove, *e.g.,* that all differentiable functions are continuous, by examining instances of differentiable functions and seeing whether there are any discontinuous ones among them; and if the domain of the quantified variable is infinite, such a procedure would anyway lead only to verification, not to proof. Every universal affirmative is anti-existential, in that it analytically entails negation of an existential statement: $_{(x)}\ [\varphi_{(x)} > \psi_{(x)}] > \sim (E_x)\ [\varphi_{(x)} \cdot \sim \psi_{(x)}]$. But to maintain the validity of the converse implication is to confuse material implication and *analytic* entailment, extensional and intensional universality. It is, *e.g.,* certainly true that no unicorns dislike cake. For, let φ stand for the predicate "being a unicorn" and ψ for the predicate "liking cake". Then "no unicorns dislike cake" is to be formalised as follows: $\sim (E_x)\ [\varphi_{(x)} \cdot \sim \psi_{(x)}]$. But in order to prove a conjunction false, all we have to do is to prove the falsity of at least one conjunct. Now, $(E_x)\ [\varphi_{(x)}]$ is false, since there are no unicorns. Thus we have proved that no unicorns dislike cake. If we accept the equivalence of the negation of the particular negative to the universal affirmative, we have thereby demonstrated that all unicorns like cake. Surely, it needs the routine of the formal logician not to be puzzled by such startling discoveries!

If we define, then, the formal a priori as characteristic of implications rather than of categorical statements, we must explicitly rule out material, extensionally defined implications. It is a necessary

condition for the implication $(x)[\varphi_{(x)} > \psi_{(x)}]$ to be valid, that $\sim (E_x)\ [\varphi_{(x)} \cdot \sim \psi_{(x)}]$. This condition is at the same time *sufficient* to define material implication. But in order to define *analytic* implication, we must introduce the modality "self-contradictory". $(x)\ [\varphi_{(x)} > \psi_{(x)}]$ is valid as an *analytic* implication, and hence *formally a priori, if* $(E_x)\ [\varphi_{(x)} \cdot \sim \psi_{(x)}]$ is not only false, but self-contradictory. The process of converting empirical laws into conventions or implicit definitions (which will in the sequel be illustrated by examples) is just this step from material implication to analytic implication. If analytic implications were based on "real" definitions beyond possibility of revision, then $(E_x)\ [\varphi_{(x)} \cdot \sim \psi_{(x)}]$, in the face of $(x)[\varphi_{(x)} > \psi_{(x)}]$, would not even be a possibility; from the implication and the fact $\sim \psi$ (a), we could, without further empirical investigation, infer the fact $\sim \varphi$ (a). But the above conjunction may occur and induce us to abandon the implication as formally a priori or definitional, instead of taking it as a rule *prescriptive* of what is a fact and what is mere appearance, because the implicatory sentence did formerly stand for a material implication, expressing an empirical law, which we now find to be contradicted by experience and hence unworthy of being any longer used as a definitional rule.

One often finds analytic statements defined as statements whose truth follows from the very *meaning* of the terms; they say nothing about the empirical world in the sense that the recognition of their truth does not presuppose any sort of empirical inquiry. This view is expressed, *e.g.*, by *Schlick*, in an essay entitled *"Gibt es ein materiales Apriori?"*: "An analytic sentence is a sentence which is true in virtue of its mere form; he who has understood the *meaning* of a tautology, has *at the same time* recognized its truth; therefore it is a priori. As regards a synthetic sentence, however, one must first understand its meaning, and thereafter find out whether it is true or false; therefore it is *a posteriori*" (*Gesammelte Aufsaetze, 22*). However, it is not quite accurate to say that all we need in order to recognise an analytic statement as true, is to understand the meaning of the terms involved; for, if its truth follows *from* the meaning of the terms, there are, on the other hand, required *logical principles, by* which it follows. The foremost of these principles is, of course, the law of non-contradiction itself. "A is B" is true, in virtue of the meaning of A; for, *by definition*, "A is XB" (where X stands for the defining predicates other than B); then, by the principle of the substitutability of equivalents, "A is B" transforms into "XB is B"; then, by the principle of simplification, this statement is equivalent (in the extensional sense of equivalence, defined by reciprocal implication, or identity of truth-values) to "B is B"; finally, the principle of non-contradiction says "X is X" (where X is a variable, standing for *any* term); by a rule of substitution, "B is B" is then derivable from the law of non-contradiction, and thus the original statement "A is B" is seen to be

true by the law of identity. This pedantic analysis is intended to reveal that the formal a priori can be defined only with reference to principles of logic, and the latter certainly cannot be said to be a priori in the same sense in which statements whose analytic character is determined by these very principles are a priori. The truth of these principles of logic cannot follow from the meaning of their terms, simply because their terms have no meaning at all: they are variables.

II

Thus the very analysis of what is meant by the "formal a priori" reveals the existence of another kind of *a priori* without which the formal a priori could not even be defined. I shall call this the *material* a priori, avoiding the more familiar term "synthetic", because the latter has been ambiguously applied, by Kant, to both the material and the functional a priori. The principles of logic themselves, which we just saw to be essentially involved in the definition of the formal a priori, are materially a priori. Their truth is a matter neither of deduction nor of induction. We are then left with two alternatives: either they are self-evident, "seen" to be true in pure "Wesensanschauung", as the phenomenologists would say, or they are conventions. Even though it would certainly be more emancipated to accept the latter alternative, and to dismiss the former alternative as mystical Platonism, I venture to suggest that we are not, here, really confronted with mutually *exclusive* alternatives. Just as empirical laws of nature are used as conventional definitions of empirical concepts, because they are *true* in a non-pragmatic sense, so the principles of logic can be used as implicit definitions of logical concepts, like negation, implication etc., because they possess some kind of evidence that is independent of the use that can be made of them. To argue that the law of excluded middle, or the equivalent law of non-contradiction, is analytic because it implicitly *defines* the meaning of negation, such that its denial would necessarily presuppose it, is no better than to argue that Newton's third law of the equality of action and reaction is analytic, because it implicitly defines the meaning of mass, or that the first law of thermodynamics is analytic because it implicitly defines internal energy. The principles of logic can, indeed, by *Wittgenstein's* truth-table methods, be shown to be "tautologies"; but this method presupposes definitions of the "logical constants" which amount to a recognition of those very principles of logic. Thus, presupposing the following definition of the negation sign '~':

p	~p
T	F
F	T

one can prove the law of non-contradiction: ~ (p. ~ p) to be tau-

tologous, *i.e.*, true no matter what be the truth-values of the components. But what else does the above definition of negation express but the couple of inferences: if p is true, then not-p is false, and if p is false, then not-p is true? And how do these implications differ from the law of non-contradiction?

Just as empirical laws have to be recognised as synthetic truths before they can be used as definitions of *empirical* concepts in terms of which they are stated, and thus *made* analytically true, so logical laws have to be recognised as synthetic ("synthetic" in the sense of non-definitional) truths before they can be used as definitions of *logical* concepts in terms of which they are stated. Once, *e.g.*, we have intuitively recognized the validity of the *modus ponens* (if 'p > q' is true, and 'p' is true, then 'q' is true), we can conventionally adopt it as an implicit definition of the symbol denoting implication; *thereafter*, of course, the validity of the *modus ponens* will follow from the very meaning of implication, and nobody could deny it unless he used the symbol '>' in a different sense. Or, to take another example, the principle of mathematical induction can be used as an implicit definition of the concept "finite integer", because of its intuitive evidence. It would hence be absurd to think one refutes the claim of *Poincaré* and the intuitionists that the principle of mathematical induction is synthetic a priori, by pointing out that it "merely" defines what is meant by a finite integer. This type of consideration applies generally to the axiomatic method of modern mathematics, the method of defining the "primitive notions" by a set of axioms or postulates which they satisfy. The postulates give rise to, are the source of, analytic truths; but they themselves must be regarded as synthetic. As *Kant* said: "One can indeed recognize a synthetic sentence as true by the law of non-contradiction, but only by presupposing some other synthetic sentence from which it can be inferred, yet never in itself" (*Kr. d. r. V.*, 2nd edition, ed. *Cassirer*, 42). Kant thus admitted that the formal *implications* that constitute the theorems of pure mathematics are analytic; what is synthetic, according to him, are the basic axioms that give rise to those analytic truths. Of course, as I mentioned already, Kant's usage of the term "synthetic a priori" is not unambiguous: in insisting on the synthetic nature of the axioms of geometry, he means to point out, first, that their denial is *logically possible*, and secondly, that it is intuitively impossible. That Kant was right on the first point, the non-analytic nature of the axioms of Euclidean geometry, has been definitely proven by the development of non-Euclidean geometries. If the parallel-axiom were logically necessary or analytic, its denial could not have led to consistent systems of geometry. But, does not an axiom like "the straight line is the shortest distance between two points", claimed as synthetic by Kant, merely amount to a *definition* of straight line? Again the answer is: it is a definition of this geometrical concept

in the same sense in which physical laws are definitions of physical concepts. Euclid did not arrive at it by an analysis of the concept "straight line" any more than Newton arrived at his second law of motion by an analysis of the concept "force". The point to notice is that concepts do not "exist" at all prior to the judgments which construct and define them. Axioms do not *analyse* the meaning of symbols; rather they *create* meanings, or concepts, and once this creation, this "synthesis", has occurred, a symbol can be attached to those conceptual creatures; *then* one can say the axioms "merely" define the meaning of these symbols. In talking that way, one forgets that analysis presupposes synthesis. "La place de la *synthèse a priori* n'est pas dans la liaison des termes du jugement, ou dans la démonstration de telle ou telle formule numérique particulière; elle est dans le processus général dont dérive tout nombre particulier, dans *la création des notions elles-mêmes*" (Brunschvicg: *Les Etapes de la Philosophie Mathématique* 207).

If I prefer the term "material a priori" to the Kantian term "synthetic a priori", for the description of the kind of independence from experience that accrues to axioms, whether logical or mathematical, it is in order to avoid the connotation of *intuitive* necessity, which at once convicts one of "psychologism". A materially a priori judgment is such that its contradictory is consistent; in this respect it differs *toto caelo* from a formally a priori judgment. But when Kant described the axioms of geometry as synthetic a priori,[4] he furthermore implied the intuitive inconceivability of the opposite; and it is this implication which I would not want to take upon myself, not because I regard it as conceivable that it should be conceivable to any one that parallels inter-

[4] It seems to me that the logistic demonstration of the analytic nature of the propositions of *pure* mathematics by no means conflicts with Kant's doctrine of the synthetic a priori in mathematics. Metamathematical research has, indeed, revealed that what is asserted, in mathematics, are formal *implications* between axioms and consequents, and that these implications are valid by the mere rules of logic, being entirely independent of intuition. But, as mentioned already, Kant admitted the analytic nature of these implications. What is synthetic, for him, are the axioms, and hence their *consequents*, which is quite compatible with the analytic character of the *consequences*. One might point out that, as *Hilbert* has shown, the axioms of mathematics are purely formal, and hence not synthetic in the sense of depending on intuition. But the axioms whose synthetic character was defended by *Kant*, are not Hilbert's formal, *uninterpreted* ones, but their Euclidean *interpretations*, and nobody would deny that the interpretation of axioms, the establishment of "Zuordnungsdefinitionen", requires intuition. If it be said that the axioms *qua interpreted* do not form part of mathematics at all, why this is a declaration of the way in which the term "mathematics" is used nowadays; which is not the way Kant used the term. Kant, one might say, was not concerned with "pure" mathematics at all, but with "applied" mathematics. His mistake lies only in this, that he regarded Euclidean geometry as the *only* interpretation of formal geometry that is of any use to physics. And presumably he would not have committed this error if he had lived in the age of Einsteinian physics.

sect, or that, in a two-dimensional plane, a line can have more than one parallel, or that two straight lines can enclose a finite space, given the *Euclidean intuitive* meanings of the terms "straight line" and "parallel", but simply because "je n'ai pas besoin de cette hypothèse" in order to defend the material a priori as a kind of a priori distinct from, and presupposed by, the formal a priori. The only advantage I can see in calling materially a priori judgments *conventional*, is that this term involves recognition of the absence of *logical* necessity, the logical conceivability (though possibly *psychological* inconceivability) of alternatives. Indeed, if logical necessity is *defined* in terms of the principles of logic, it would be absurd to ascribe logical necessity to the principles of logic. Still, being, in their capacity as *normative* principles, logically independent of experience, they are a priori principles. Shall we, then, call them conventions? Is, in other words, the material a priori perhaps reducible to the functional a priori? No, not reducible to, but compatible with it. Why should utility and a priori truth be incompatible? The principles of logic, it would seem, are useful conventions, not *in spite of*, but *because of* their a priori truth.

It seems to me to be making a rather cheap use of Occam's razor, if one dismisses the claim of the apostles of "Wesensanschauung" that there are materially a priori truths, as "psychologism",[5] or, even worse, mysticism. It must, of course, be admitted that some of the allegedly "eidetic truths" resolve, upon analysis, into analytic statements, and are confusedly called materially a priori, just because descriptive terms occur in them. However, the really interesting cases of synthetic a priori truths are afforded by *Judgments of Interpretation*. Consider the judgment: "time is a series", where a series is defined by the properties of asymmetry and transitivity. Once I have *intuited* that temporal instants are substitutable as proper values for the variable relata of an asymmetrical and transitive relation, I can, of course, use the formal properties of asymmetry and transitivity to *define* time; and *thereafter*, indeed, judgments like "time is irreversible", or "if Tuesday comes before Wednesday, and Wednesday comes before Thursday, then Tuesday comes before Thursday", will turn out to be analytic. But the *synthetic* judgment, presupposed by these analytic judgments, lies in the substitution of temporal instants for the variable relata. This act of interpretation cannot be reduced to the abstraction of a structural property from material instances, and thus to an inductive process. For time is one, it does not have instances in the sense in which a class-concept has instances. Logically speaking, I cannot abstract the structural properties of asymmetry and transitivity from an examination of times, *i.e.*, parts of time. For, in the first place, the very

[5] Notice that Husserl's phenomenology started out as an explicit revolt against psychologism! *Cf. Logische Untersuchungen*, I.

meaning of those properties requires at least 2, or 3, "times", *i.e.*, elements of time. And, secondly, if within these minimally extended parts of time those properties do hold, it still does not follow that they would hold within the parts of time that are compounded out of those minimal parts. And to reason from the fact that parts of time have those structural properties to the fact that time *as one* has those properties, is not at all analogous to inductive extrapolation, the inference from *some* instances to *all* instances. For, as *Kant* pointed out, the relation between time and its parts (like the relation between space and its parts) is essentially different from the relation between a class and its members. I can think of a member of a class without thinking of the class, while I cannot think of a part of time otherwise than as a "limitation" of continuous, infinite time. *"Idea temporis est singularis,* non generalis. Tempus enim quadlibet non cogitatur, nisi tamquam pars unius eiusdem temporis immensi. . . . Omnia concipis actualia *in* tempore posita, non *sub* ipsius notione generali, tamquam nota communi, contenta" (*De mundi sensibilis atque intelligibilis forma et principiis,* paragraph 14). Time, in other words, is a continuum, not a discrete collection, like an extensional class. How does one verify the judgment of interpretation: "time is a continuum"? ("continuum" in the pre-Cantorian sense, *i.e.*, defined solely by "density" or "compactness".) It certainly is not analytic. Then is it an inductive generalisation? In that case one would have to admit the possibility that, if the process of dividing time were only continued far enough, we *might* encounter *discrete* parts of time, *i.e.*, parts of time not separated from one another by other parts. Is one convicted of "psychologism" if one regards such a state of affairs as inconceivable and hence the judgment "time is a continuum" as "synthetic a priori"? Surely, if one were to insist that "time is a continuum" is no more than an inductive generalisation, one would have to admit that it is not the *same kind* of inductive generalisation as those that apply to classes of natural objects. A judgment represents an inductive generalisation if it presupposes as a necessary assumption the uniformity of Nature. The very concept of "uniformity", however, is defined in terms of continuous time: the statement of a given functional relation (*e.g.*, the law of gravitation) represents an inductive generalisation if it is assumed to hold at all places and *at all times;* time, however, enters into the equations of physics (whether explicitly or implicitly, through the "time derivatives") as a *continuous* variable. Hence, to say "time is a continuum" is an inductive generalisation, involves an obvious circularity. One can, of course, regard this judgment as "synthetic a priori" in the *functional* sense of Kant's attribute: science *assumes* time to be continuous, just as it assumes space to be continuous, in order to be able to correlate it with the number-

continuum, and thus to render a mathematical treatment of motion possible. This is true enough; but it is by no means conflicting to call a judgment both functionally and materially a priori. On the contrary, if the judgment under discussion is functionally a priori, *i.e.*, adopted as a necessary presupposition of science, it is *because* it is materially a priori, *i.e.*, intuited to be the case. But is not this appeal to "self-evidence", "inconceivability" of the opposite, outmoded dogmatism? At one time, *e.g.*, energy was assumed to be a continuous function. Nowadays, quantum-physics has produced experimental evidence that it is a discontinuous function. Could not the same happen with respect to *time?* No, it could not, because, as Kant has shown, time is not an object of experience at all; it is a "constitutive condition" of empirical objects. One can experiment with energy, and other empirical functions; one cannot experiment *with* time, one experiments *in* time.

Before proceeding to a discussion of the *functional* a priori, let us emphasize that the material a priori has, by us, been defined negatively rather than positively: a materially a priori judgment is neither analytic nor inductive in the ordinary sense. Phenomenologists define the material a priori *positively* by self-evidence, disclosed in pure "Wesensanschauung" (eidetic insight): the evidence of the judgement is independent of multiplication of instances; as *Goethe* characterized *Galilei's* discovery of the isochronism of the pendulum: *"Ein* Fall gilt ihm fuer Tausend". But if one argues for the material a priori in terms of self-evidence, one throws oneself open to the accusation of confusing logic with genetic psychology. No doubt, Galilei did not discover the law of the proportionality of fallen height to t^2 by the method of "simple enumeration". But the question of how a law is discovered must not be confused with the question of the logical validation of that law. Being a statement about empirical objects, Galilei's law is valid only in so far as it applies to a vast number of instances, unless it be deduced from other empirical laws; and in so far as the premisses from which it might be deduced must themselves be empirical, the reference to many instances will always be *logically* essential, although it may be *genetically,* in the order of discovery, inessential.

The material a priori does not, indeed, belong to the province of *formal* logic. For formal logic the disjunction: either analytic or inductive, is exhaustive, because the formal logician deals only with "ready-made", *i.e.*, already defined, concepts, leaving the process of constituting concepts, the process of constructive definition, to the concern of "genetic psychology". A judgment is analytic if it is true (directly or indirectly) by definition, and the *raison d'être* of the definition from which analytic truth derives is of no concern to the formal logician. Being aware of this limited scope of formal logic, Kant felt the need of supplementing it by a more comprehensive

"transcendental logic" which investigates the process of noninductive synthesis which precedes and renders possible analysis. Accordingly, "transcendental logic" is, to use a characteristic term of *Hermann Cohen's,* occupied with the "Urteil des Ursprungs". If one dislikes the notion of "Bewusstsein ueberhaupt" because of its metaphysical "pathos of obscurity", and holds that, in any proper sense of the term "Bewusstsein", *Bewusstsein* is the subject-matter of psychology, not of logic, then, in so far as the subject-matter of transcendental logic is claimed to be *Bewusstsein ueberhaupt,* one may hold that transcendental logic reduces merely to genetic psychology. However, it is a historical fact that what is commonly called genetic psychology has *not* concerned itself with the problem of the origin of scientific concepts and their articulations in the form of definitions. In so far it would be at least as improper usage to call this kind of investigation "genetic psychology" as to call it "logic".

Let me concretely illustrate the difference between formal and transcendental logic, and the place of the material a priori within the latter. I may refer back to the already discussed judgments "time is irreversible" and "time is a continuum". The formal logician straightforwardly asks you for the definitions of subject and predicate, and once these definitions have been supplied, he can easily determine whether the judgments under analysis reduce to mere exemplifications of laws of logic and are thus *logically* true. The *origin* of the definitions themselves is irrelevant for the purpose of formal logic. Definitions, "primitive notions" and axioms (or rather, with respect to the postulational technique developed by *Hilbert,* axioms definitory of primitive notions) are the basic elements for formal logic. But there is no reason why these basic elements that are taken for granted, presupposed by formal logic, may not constitute a problem for "transcendental" logic. Let us analyse the following judgment: "If A is higher in pitch than B, and B is higher in pitch than C, then A is higher in pitch than C". If the relation "being higher in pitch" is *defined* as a transitive relation, then, of course, this judgment is analytic. Or suppose what is defined as transitive is the more general relation "being higher than". Then the above judgment may be analysed into the analytic judgment "If A is higher than B, and B is higher than C, then A is higher than C", and the synthetic judgment that this analytic judgment is *applicable* to tones as far as their pitches are concerned. Is this synthetic judgment, *viz.* that tones order themselves according to height of pitch, inductive in any ordinary sense? Is it conceivable that there should be found tones that do not order themselves according to height of pitch, or colors that do not order themselves according to lightness, the way it is conceivable that there should be found white crows, or masses that do not obey the law of gravitation? If it

is not, thus a formal logician would presumably argue, it is because tones are *defined* in terms of that transitive relation, just as the integers are (ordinally) defined in terms of the transitive relation "being greater than". This kind of reasoning befits a formal logician, because, as mentioned in the discussion of the formal a priori, for formal logic the essential can mean only the definitory. But unless one dogmatically dismisses all phenomenological analysis as "psychologism", one must admit that it is not naïve scholasticism to say "it is of the *nature* of tones to have that structural property, and therefore they are defined as having it"; the ground of that definition certainly is not inductive in the same sense in which the ground of the definition of whales as mammals is inductive. Also the definition of "being higher than" in terms of the structural property of transitivity may, from the standpoint of "transcendental logic", be said to presuppose, genetically, the materially a priori judgment "it is of the nature of the relation 'being higher than' to be transitive". Insight ("Wesensanschauung") is required whenever a formal definition is applied to a specific case and the nature of the case is such that the validity of the application cannot be inductively verified (unless, indeed, the meaning of the term "induction" be stretched to such an extent that "thought experiment" is regarded as an inductive process). Inasmuch as such insights form an essential part of the cognitive process, it should be conceded to transcendental logic—which "transcends" the scopes of formal logic and inductive logic separately—to register judgments expressing such insights as belonging to a separate category, the category of the material a priori.

III

Any synthetic sentence,[6] whether empirical or "eidetic", may be *made*, by a conventional act, into an analytic, formally a priori, sentence. But it is usually *made* formally a priori, in order to be *taken* as *functionally* a priori, *i.e.*, a hypothetically necessary presupposition, a "procedural means", as *Dewey* would say; or, as *Kant* called these functionally a priori principles, a "Grundsatz", in contradistinction to an analytically demonstrable "Lehrsatz". In the case of empirical systems, these sentences are, prior to their being adopted as functionally a priori, empirically synthetic (in part, at least); in the case of conceptual systems they are "eidetically" synthetic. Thus, the postulates which implicitly define the "primitive notions" of *Peano's* system of arithmetic (*e.g.*, the principle of mathematical induction: if x is an integer, then $p\{[p(o) \cdot P_{(x)} > P_{(\text{suc}\,x)}] > P_{(y)}\}$, or *Hil-*

[6] I use here the term "sentence" instead of the term "proposition", in order to obviate the objection that a proposition, interpreted as the "Sachverhalt" expressed by a sentence, ceases to be the same when the sentence that expresses it ceases to be synthetic and becomes analytic.

bert's postulates which implicitly define the primitive notions of pure geometry, are, prior to their *use* as postulates definitory of the primitive notions of the system, eidetically synthetic (materially a priori). In Carnap's language of the "logische Aufbau", such postulates might be characterized as "constitutions" ("constitution" taken as a verbal noun, not as a past participle) of the "basic elements" of the respective system. Once the basic elements, or primitive notions, have thus been constituted, they can be reanalysed in terms of these constitutive postulates, and the latter will then, of course, appear as analytic. But this analysis presupposes the synthetic process in which the primitive notions were first constituted. In so far as there is no logical necessity in the choice of a specific set of notions as primitive (or postulationally defined), the basic postulates may be treated as conventions or functional necessities. However, it is especially with respect to the postulates of empirical science, that we must be on our guard against the identification of the conventional with the arbitrary. If the basic postulates of physics have methodological value and can be *profitably taken* as a priori in the functional sense, it is because they have *fundamentum in re*. Consider, for example, the principle of the conservation of mechanical energy: its formulation presupposes the definition of potential energy as the negative of the space-integral of force:

$$-dV = F d\xi; \text{ hence } V = -\int_{s_2}^{s_1} \sum_i F d\xi.$$

But in this definition the *existential* assumption is implicit that V *exists* in the sense of being operationally definable as a function of position only, in contradistinction to kinetic energy which is a function of both position and velocity. Now, that the conservation principle, as a consequence of what I like to call a "definition with existential import", is not a priori in the sense of being analytic, is evidenced by the fact that actually all real systems are non-conservative, since, owing to friction, some energy is always lost during the motion of a system. On the other hand, if the principle were a posteriori, it would have to be rejected as false in the face of this fact of non-conservation. But instead the physicist saves it by introducing a new form of energy, *viz.* heat energy. The mechanical energy that is dissipated by friction is conserved in the form of heat. This extension of the concept of energy—as expressed by the first law of thermodynamics—is, however, to use *Poincaré's* phrase, though conventional, not arbitrary. For its *empirical* basis is *Mayer's* and *Joule's* discovery of the quantitative equivalence of heat and mechanical work. If energy, in this extended form, should still fail to be conservative, the physicist would still search for a further quantitative equivalence between the lost amount of energy and some new form of energy. The conservation principle thus functions as a *leading principle:* it expresses the physicist's faith

that *something* is constant in Nature, and this faith progressively "enacts its own verification", as *James* would put it.

Again, *Newton's* second law functions as an a priori principle, it is, in *Dewey's* language, "operationally a priori with respect to further inquiry"; it tells the physicist how to measure force, thus prescribing a method. Methods cannot be directly refuted (in fact, the expression "to refute a method" does not even make syntactical sense); in so far methodological postulates are a priori. But they may be *indirectly* refuted, *i.e.*, they may be proven fruitless by the failure of the empirical laws that gave rise to them to be verified; in so far they have *fundamentum in re* and are open to revision by experience. The empirical fact that led to the methodological postulate expressed by Newton's second law is, that force manifests itself as change of velocity, while before *Galileo* force was supposed to be the cause of changes of position. As *Mach* describes the *empirical* character of Newton's second law: "Before Galilei, force was known only as pressure. Now, nobody who has not experienced it, can know that pressure does at all produce motion, and still less *how* pressure passes into motion, that pressure does not determine position nor velocity, but acceleration. . . . It is hence not at all obvious that the factors which determine motion (forces), determine *accelerations*" (*Mechanik*, 142).

Theoretically, any postulate, whether it be a formal axiom or an empirical hypothesis, can be adhered to, whatever deduction or induction may disclose. For the so-called *experimentum crucis*, based on the contrapositive mode of inference, is, if taken to apply to *singular* postulates, an illusion. One cannot deduce consequences from one singular postulate or hypothesis; there is, for the possibility of deduction, required a *set* of postulates or hypotheses. Hence, what the falsity (whether empirical or formal) of a deduced consequence entails, is not the falsity of one definite postulate, but the *inconsistency* of a set of postulates. Let us symbolize the set of postulates (no matter whether these be formal postulates or empirical hypotheses) by the conjunction $p_1 \cdot p_2 \cdots p_n$, and the deduced consequences by $q_1 \cdot q_2 \cdots q_n$. Then not $-q_1$ entails not $-(p_1 \cdot p_2 \cdots p_n)$. The negation of a conjunction, however, is equivalent to a disjunction of negations, *i.e.*, not–$(p_1 \cdot p_2 \cdots p_n) \equiv$ (not $-p_1$ or not $-p_2$ or . . . not $-p_n$). We are thus left with the materially indeterminate conclusion not $-p_1$, *i.e.*, we are free to choose among alternative falsities; we are free to decide which one of our postulates we want to abandon and which ones we want to continue to adhere to. If, *e.g.*, the planets should be observed to deviate considerably from the elliptic paths determined by *Kepler's* laws, one would have to infer, by contraposition, the falsity of either the law of gravitation or the law of inertia or the law of the parallelogram of forces; provided, indeed, one is assured of a *complete* knowledge of

the initial conditions: it may well be that the deviation from the expected path might be ascribed to the disturbing influence of a force exerted by a hitherto unknown planet. Since the law of gravitation is less general than either one of the two latter laws, upon which the very possibility of the geometrical construction of motion depends, the physicist would probably choose to abandon or revise *it*. It thus appears that whether a hypothesis functions as a priori or not depends on the degree of its generality. It is the most *general* laws that are under all circumstances adhered to as methodological postulates or leading principles, because the very possibility of science depends on their validity. The very possibility of statistical physics, *e.g.*, or the applicability to physics of the calculus of probability, presupposes the validity of the two synthetic axioms that *define* a probability-aggregate: the axiom of randomness, which defines the non-causal nature of a series of events (in *Schlick's* formulation, this axiom states, that a series of events is non-causal "if, in the case of a very long series of observations, each series to be formed out of the different events by permutation (with repetition) has the same average frequency (whereby only the series would have to be small in comparison to the total series of observations)"; (*cf. Die Kausalitaet in der gegenwaertigen Physik*, in *Gesammelte Aufsaetze*, 71) and the axiom of the existence of limits to series of relative frequencies. These axioms are functionally a priori or, as *Kant* would say, "synthetic a priori principles of experience", not because they express "apodiktische Wirklichkeitserkenntnis" (as Schlick wrongly interprets the meaning of Kant's "synthetic a priori"), a priori insights into the nature of reality, but because they are universal "conditions of possible experience" (where "experience" means "science"). Being undoubtedly synthetic (although they are *used* to *define* the subject-matter of statistical physics), they are not *formally* necessary; their necessity is but functional.

Kant always uses the terms "necessity" and "universality" as equivalents; and, indeed, one intuitively feels that there is an inner connection between these categories. We may now give a precise meaning to this equivalence, by showing that functional and formal necessity are, though distinct, *continuous* with each other in the *Leibnizian* sense of continuity: formal necessity may be interpreted as a *limiting case* of functional necessity. A formally necessary, or analytic, judgment, we said, is a judgment whose contradictory is inconsistent. But inconsistency is an irreflexive relation, *i.e.*, no judgment can significantly be said to be inconsistent *with itself*, but only with other judgments. The differentia of *formal* inconsistency, in terms of which formal necessity is defined, as contrasted with material inconsistency, in terms of which functional necessity is defined, is, then,

the fact that violation of the most general laws, *viz.*, the laws of logic, is involved: p_i, denoting a variable member of the set of postulates $p_1 \cdot p_2 \cdots p_n$, is functionally necessary if it is so *general* that its negation would entail the negation of a vast number of empirical laws; not $-p_i$ would then be said to be to a high degree *materially* inconsistent. p_i, now, is said to be *formally* necessary, if not $-p_i$ is formally inconsistent; this, however, means that it contradicts the laws of logic, and the latter are themselves functionally necessary in the *highest degree*, in so far as their rejection would force us to abandon all laws whatever. Formal necessity is thus seen to be equivalent to the highest *universality* of the laws by inconsistency with which functional necessity is defined. It is to be noted, though, that formal necessity is not thereby "reduced" to functional necessity. Inconsistency with the laws of logic remains *sui generis*, although it can be interpreted as, so to speak, the upper limit of material inconsistency. The laws of logic themselves cannot be said to differ merely quantitatively from functionally necessary laws, such as to be defined by the property of having functional necessity in the highest degree. For functional necessity itself is defined in terms of the logical relation of inconsistency, which is itself defined in terms of the laws of logic.

In summary, it should be noted that, although the formal a priori, the material a priori and the functional a priori are, as categories or epistemological predicates, *distinct*, they are quite compatible in the sense of being predicable of one and the same sentence. As a matter of fact, the main intent of this analysis has been to mark out the different types of epistemological status that accrue to statements in the process of scientific systematization. Synthetic statements, whether they be empirical or materially a priori, are *made* into analytic statements in order to be *taken* as "leading principles" or "conventions". Hypostatisation of the categorial *distinction* between synthetic truth and conventional-analytic definition into existential *separation*, such as to think of the statements which are epistemologically qualified by these categories, as of mutually exclusive classes, gives rise to a radical misconception of science. If definitory or analytic statements are of any use in inquiry, if they have, in other words, existential import, and are not idle *nominal* definitions, it is because they are synthetic in origin. "Being conventionally definitory" and "being synthetically descriptive" (whether descriptive of "matters of fact" or of "eidetische Sachverhalte") are no doubt distinct predicates; but this distinctness should not mislead us into throwing "conventions" into one basket, synthetic truths into another; for then we bring the puzzles of applicability upon us. And these puzzles should not be belittled, in the manner of *Schlick*, who dismisses applicability as a pseudo-problem due to lack of semantical analysis. For example, in

his article "Gesetz und Wahrscheinlickkeit", he "solves" the puzzle that chance should be predictable, that there should be, paradoxically, "laws of chance", by the simple semantical observation that "the rules of probability apply to chance events for the simple reason that what we *call* chance events, are those events to which they apply". This is like arguing that there is no problem of induction, since the word "nature" is *defined* as the totality of events in so far as they obey laws. If there were no uniformities in events, if mathematics, consequently, were not applicable to empirical data, we simply would not possess a concept of nature, hence it would not occur to us to set up such a definition. The same considerations apply to the possibility of statistical physics: if irregular or non-causal series of events did not, *as a matter of fact,* exhibit statistical regularity, in the sense that finite series of relative frequencies *approximate* to limits, we simply would not come to possess that well-defined concept of "chance-event", of which Schlick is talking; or, at least, it would be a purely formal concept without existential reference. Schlick's quoted statement typically exemplifies lack of "transcendental logic", *i.e.,* awareness of the fact that concepts that have, in Kantian phrase, any "reference to objects", do not exist "ready-made", but are first constructed by synthetic judgment. Why should the principle of mathematical induction apply to integers? Because integers are *defined* in terms of that principle; integers that do not obey mathematical induction could not legitimately be *called* integers. But the question is: *quid juris* the *concept* of integer, or, which amounts to the same, *quid juris* that principle which defines the concept? Again: Why should Nature obey conservation-laws? Because Nature is defined in terms of conservation-laws; but the question is: *quid juris* such a concept of Nature? Why should there be conservation-laws? Why should that definition have existential import? Why should such a concept of Nature "refer to objects", rather than being an idle fiction? If one forgets that analysis presupposes synthesis, one is led to perform the "ontological leap": Why should God exist? Because God is *defined* as existing. But *quid juris* the concept of a being among whose definitory properties there is existence itself? Why should such a concept "refer to an object"? Why should such a definition be *real?*

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THE LANGUAGE OF POETRY

MATTHEW ARNOLD'S prediction that the language of religion and philosophy will be in mankind's good time replaced by poetry was never taken very seriously, even in the sanguine nineteenth century whose shibboleth was "progress". In communicating philo-

sophical ideas, who wants his presentation cluttered up with the extraneous art-form of poetry? Nevertheless, and though the poetic diction question is always pragmatically met and dealt with in the prose language used to convey it, Arnold continues to receive part-way support from the aesthetician; and poetry is held in certain modern aesthetic theories to succeed where ordinary language fails as an instrument for communicating high truth. But there are no abstruse or formal poetic vocabularies. On the contrary, the art demands simplicity and clarity in its basic language material. How then does it differ cognitively from prose?

Words in poetry are primarily emotive. They belong strictly to the art field; yet they may be taken from it for comparison with language in its usual referential aspect. For poetry uses as its art-stuff the common speech of mankind and both the vocabulary and the construction must be clear and correct. "Poets", as Wordsworth knew, "do not write for poets alone, but for men." But the emotive character of poetic diction which is only in part discoverable in the rhythm and other obvious externals is not confined to the verbal symbols. Indeed it belongs far more intimately to their meaning. The poetic form throbs in the poetic content; it is spiritually rather than materially perceived. Thus in poetry no less than in painting and sculpture the enjoyer feels an at-oneness with the presentation such as Schopenhauer recognized as a unique quieting influence upon the blind and restless human will. Can we maintain, then, that apart from the musical arrangement there is no special poetic diction? But dare we say that the music itself in the carefully selected words and word-groupings, throws a new light—a Roentgen ray—on ordinary language and language usage? This is true even though the music is inseparable from both the verbal symbol and the meaning in the poetic composition.

Poets have long been recognized as "well-heads of grammar"; they may likewise be held well-heads of semantics, combining as they do the subjective and objective aspects both of thought and language. In its revelation of temperament in individual poets, poetic beauty (which beauty, as everywhere, is its own excuse for being) shows, in addition to the thought expressed, the mood or atmosphere in the thinker's mind. But when the word disappears into its meaning (as it does in all language expression) in poetry it reappears as a music carrier and explicitly vocalizes the "universal language" of melody. The "beauty" of poetry, in other words, partakes of the verbal-form as well as the thought, and shows the one indistinguishable from the other; and in so doing it reveals analogically what is logically portrayed by the theme —the indissolubility of subject-object and particular-universal truth relations.

The special symbolization in poetry, in which the art-stuff is language, requires that both vocabulary and syntax be selected from the real language of men. And it is to be emphasized in this connection that language as such is not an art-form but an extremely practical instrument of thought; and, on the other hand, it is to be emphasized that the language of poetry has a specialized art function. Whoever fails to take account of the behavior difference between prose and poetic language on either the form or the content side falls into one of two errors. Either he holds poetry superior to prose, agreeing with Arnold that "poetry is nothing less than the most perfect speech of man, that in which he comes nearest to being able to utter the truth",[1] or he believes with Hegel and his British follower, Bosanquet, that poetic representation is strictly internal and can be translated into prose or foreign languages with no essential alteration—that is, that the poetic form is incidental instead of being fundamental. The truth is that there is no comparison possible on ideal valuational grounds between prose and poetry. A choice between them as communication forms is a choice between nature and artifice; and men are artists because they cannot be creators in the strict sense but must "think God's thoughts after Him"—as poets or "makers" in the Greek meaning of the term. When Aristotle called art the imitation of nature he was assuredly thinking of the artist as a person whose ability has been developed to express fully in sense media, whether visual or aural, the constructive instinct at the level of contemplation.

To turn from natural methods to art as communicating on a higher level is an ancient temptation; and the artist has always been held God-intoxicated.

> Himself from God he could not free;
> He builded better than he knew—
> The conscious stone to beauty grew.

It is, however, as Plato saw, just through poetic analogy that the difference between nature and art production is seen for what it is—the distinction between divine and human, or secondhand, creativity. Joyce Kilmer was profoundly right in the closing couplet of "Trees" regarding the relation of the poet's work to God's work:

> Poems are made by fools like me,
> But only God can make a tree.

And, we may add, in full agreement with Greek thought, that only God can make the idea of a tree, in the sense of formative concept.

II

Modern aestheticians who may or may not admit their debt to the last-century apostle of "sweetness and light" cannot have, any more than Arnold had, logical bases for the assumption that poetry is the

[1] *Essay on Wordsworth*, Matthew Arnold.

language of higher insights than those expressed by the language of science. As Santayana wittily and truly stated, "There's no fancy like a fact." In such a classification of poetic and scientific language as that of Mr. Max Rieser (who has written an article on the relation between poetic and scientific thought recently[2]), whose distinction between the two forms of expression hinges on the notion that poetry is the language of valuation opposing the reportorial language of scientific fact, the prose of philosophy and religion would fall perforce into some indeterminate limbo between the valuational heaven of poetry and the non-valuational realm of fact where presumably the philosopher may

> Sit on a fence
> Between reason and sense—
> Sit there and relax,
> Whittling "values" from "facts".

Such a neutral ground, however, is hardly possible to the human imagination dependent as it is on what Mr. Rieser discovers is a "deeply ingrained" habit—the "human habit of looking valuationally on all things" including philosophers and their own urge to evaluate facts.

There are interesting implications in Mr. Rieser's own thoughtful (albeit biased) appraisals of the language of poetic and scientific thought. Among them is his alignment of poetry with mystery. "The mysterious", he tells us, "is the unknown known and it is the subject matter of poetry, which proceeds from the familiar to the mysterious in contradistinction to science which goes from the unknown to knowledge." Without questioning the epistemological presumptions here (though the aesthetic philosopher reverses the usual order in scientific learning which is that new discoveries are made on the basis of old ones) we can accept the idea that poetry aligns mystery with value. (Perhaps an even better term than mystery would be admiration in the old meaning of wonder.) But if poetry connotes mystery in the study in question, science it would seem, as representing the "inquisitive" level rather than the "expressive" plane on which the poet works, is a faith-inspired activity—faith that there are answers to science's questions. The elements in knowledge of mystery and faith certainly need to be taken proper account of epistemologically; and Mr. Rieser may be congratulated on his admission of their place in poetic and scientific communication in this era of positivism and scepticism in philosophy.

But Mr. Rieser, in his failure to see that the unique subjectivist character of poetry in comparison with science expression is owing wholly to the former's art status, fails also to recognize the real difference between the subjective and the objective aspects of knowing.

[2] *The Journal of Philosophy*, xl(1943), 421-435.

"The mental mechanism", he says, "functions differently when it grasps a simile and when it grasps such facts as $2 + 2 = 4$, or that a lion is a cat." The first activity which he defines as "a synthetic grasp of valuational affinity"—and as such poetic—is likewise declared to be strictly subjective; the second, which is described as "an analytic grasp of factual uniformities pre-existing within, or ideated uniformities applicable to the real"—a scientific operation strictly—is held wholly objective. Is there any sound reason why simile relationships should be handled exclusively by the subjective,[3] and quantity or quality relationships limited to the objective side of knowledge? Further, is not each type of knowing as necessarily analytic as it is synthetic or synoptic? The force of a simile is in its proper application to the truth situation; and a similitude is as "objective" as mathematical or other physical science facts are. In the old story of the blind men and the elephant, we realize that the similes used by the men to describe the new object in their experience were inadequate as the result of their lack of awareness of the existence of things like elephants besides things like walls, ropes, snakes, trees, and so on. A false analogy of art to experience ascribes value judgments to individual determination or caprice though it leaves mathematical findings or generic classifications to the objective order. But the artist is not an arbitrary individualist in selecting the ideas his art extols. Not only the ideal contents expressed but the ideal forms employed are alike to be judged by definite art standards. "One should be fearful of being wrong in poetry", wrote Joubert, the literary critic's critic, "when one thinks differently from the poets, and in religion when one thinks differently from the saints." The French thinker's test for poetry was as simple as it was practical. "Unless it enraptures", he said, "it is not poetry; the lyre is, so to speak, a winged instrument." Let it be noted that this test is objective.

And beyond the enrapturing power of poetry it is possible for a philosopher of art to distinguish the language content from the language form, though the poetic product, like that of any other art, represents a complete unit in which material and idea are differentiated in terms of one another. It is likewise possible (and even more fruitful as a step toward understanding aesthetics) to make a comparative study of art materials and discover that nowhere outside poetry is the sense-medium already the vehicle of the idea,[4] and to see that poetry,

[3] When Heine said, *"Du bist wie eine Blume"*, to describe the object of his lyric, he added the logical detail *"so hold und schön und rein"* to prove the validity of his "valuational affinity"—that is, the flower and the girl had certain clearly definable traits in common; and the simile in so far is as definitely objectively as subjectively just.

[4] That is, language is a definitely preformed artistic medium and as such is to be sharply opposed to a piece of marble, for instance, which *per se* does not represent the idea of a horse—or a general; even the tones of the musical scale are "everywhere in the world—loud, soft, and all is said" until given the musician to use to express the "language" of music.

the word-art, has in itself the foundation for a better understanding of the semantic problem than may be found elsewhere. Yet the philosophy of language will be shown to be wider than that of poetry through recognition of the way the poet manipulates and selects his words to make the beauty of truth at once the beauty of the language expressing it. The beautiful speech, the art stuff, is transformed yet identifiable with the very same language outside the strictures of poetry; and it is by this fact that the philosophy of poetry as included in the philosophy of language reveals its propadeutic relation to the latter study.

III

In considering the transformation of verbal symbols in poetry, it is to be remembered that the dualism of words-in-use and words-by-definition is the same in the poetic idiom as in any language expression. Further, language as behavior and language as symbology (the two aspects of the relation of verbal signs to their referents, both of which must be taken account of, without the one being confused with the other) represent two disparate verbal categories. Yet the intelligibility of words in general is owing to their double role of proxy for an idea and of the idea itself. In ordinary word usage, however, we do not hold the symbol-reference before the mind to the same degree that we hold the thing-reference, though the former is always in the background; but words viewed as communicants are certainly thought's symbolic machinery at the same time that behavioristically they are the very thoughts themselves. And in poetry the word as thought's most intimate instrument is not shoved aside. Poetry is not genuinely translatable into another language because the need for the particular word in the particular context is absolute; the verbal symbol in expressing the truth-situation is artistically inextricable from the thing thought of, which is in turn indissoluble from it, being the poetic idea.

The symbolism in poetry is thus very complex. Here are represented existential contexts by means of conceptual contexts, and *vice versa;* and the verbal symbol is inextricably bound up with both at the same time. But existential and conceptual contexts already enjoy a peculiarity of relationship; the first, though known by means of the second, includes the latter as existences since the real world is a multiplex of variously related things: it is composed of natural objects and it is composed of minds as well as "eyes that see the minds". Poetry in its portrayal through its verbal symbols of the symbol-object-idea as a single entity resembles the other arts in that its sense material forms the first creative level, as we follow the cognitive advance in the artistic creation.

Miss Dorothy Walsh's treatment of the difficult art-cognition question in the September, 1943 issue of this *Review* is unusually clear. However, she makes the mistake in conclusion that a work of art is

the representation of a purely personal individual point of view. Such a summing up of her thesis vitiates the otherwise sound reasoning shown in her understanding of the complex relation between the existential and the conceptual contexts and the artist's view of both as "raw material for a new creation". Yet the raw material is admittedly preformed; and the artist only reveals hidden beauty. The new creation nevertheless—and herein is the genesis of Miss Walsh's erroneous conclusion—is held to differ intrinsically from "anything that God or nature, philosophy or science, politics or history, or art itself" can give the artist. Thus Miss Walsh confuses the artist's purpose with his subject matter as such; but the poet above all shows that artists neither add to nor take from the truth-situations they must sincerely portray.

The first cognitive level in poetry may be called the sub-structural since it is the relatively neutral sense stuff on which the structure or existential context appears; and on the structural basis in turn the superstructure or conceptual context rests. The three levels are, of course, analytically indissociable and yet represent degrees of meaning in the artistic creation. To take a simple example from sculpture, let us look at Saint-Gaudens' memorial statue which Henry Adams commissioned him to make for him after his wife's death. The figure has bronze for its sub-structure, a person for its structural level, and brooding loneliness (or whatever else was its superstructural purpose which Adams had outlined carefully beforehand to the artist). These levels are coalesced in the statue; and the same kind of union takes place in all art forms through three general stages. But poetry having an ideated substratum for the superimposition of the particular and universal levels presents a different situation from sculpture.

At the art-material level, poetry has its sub-structure already charged with meaning. This meaning partakes further as much of the existential as of the conceptual aspects as expressed in the completed art work. What the poet must do is to throw these levels into sharp relief and yet keep them at the same time in complete union. He does this by means of his musical arrangements. The verbal symbol in poetry, exactly like the bronze of Adams' memorial statue, expresses three degrees of meaning: First, the art-material or the verbal symbol as such; second, the emotive or musical structure; and third, the interpretive or meaningful superstructure. For where word-music is distinguishable yet not separable from its conceptual content, and where the verbal symbol supports two non-dissociable degrees of meaning by drawing a distinction between them at the same moment that it unites them, we have poetry; but we have also a representation of what occurs in all language usage. Poetry, being an art, exploits verbal signs, exhibiting symbols as equally melodic and

meaningful, and makes of language itself a mirror of communication. The poetic word, in short, re-presents or mirrors prose speech; and through this act of mirroring (which is art) beauty seizes the observer, such beauty as reveals that the least judgment in the life of the individual mind must exceed in value the poet's finest product.

Now when the poet telescopes word, idea, and thing into the immediacy of relation they have in poetry he does only what is done in our usual word behavior. That is, he represents respectively the universal and the particular relational elements in the truth-situation as the relation of ideas to things; also, he shows that the nature of the relation of words to ideas and ideas to things is a transcendent one. Such portrayal, however, is no more the poet's real purpose than the sculptor's is to show Aristotle's purposive intelligence at work in the world. If the poet presents artist-wise the conceptual and the existential contexts as distinguishable only in terms of one another and the two correlated in the same verbal art-stuff, this is just his *modus operandi* for ensnaring beauty. In "reflecting" the existence of a triune transcendence in word-idea-thing, he is certainly proving neither Bishop Berkeley's eighteenth-century nominalistic "discovery", *esse est percipi*, nor Hegel's nor any subsequent subjective idealism which tries always so mightily to be factual. However, he proves, if anything, just the opposite of the Berkeleyan thesis; for, like any other artist, the poet takes the corporeal world as he finds it, exercising at once his artistic and critical faculties in making selections for his own creations.

We come to the unique place of the metaphor in poetry. Though the metaphor and its twin, the simile, are not constitutive of poetic symbolism, they exemplify the word-idea-thing inter-attachment and are thus a kind of natural *décor* for the word art. It is too much, nevertheless, to hold that metaphors, where one thing is called another thing, and similes, where one thing is said to be like another thing, are poetic essentials. A great deal of genuine poetry has been written which is not metaphorical, either implicitly or explicitly. Even a master of poetic imagery like A. E. does not depend on the metaphor for some of his most fascinating effects. Indeed in the poem, "The Symbol Seduces", he cries to the very image of Beauty,

> Away! the great life calls; I leave
> For Beauty, Beauty's rarest flower;
> For Truth, the lips that ne'er deceive;
> For Love, I leave Love's haunted bower.[8]

In both the metaphor and the simile there is a kind of play on the fusion of thoughts-as-things and things-as-thought-of that obtains in

[8] *Collected Poems* by A. E., Macmillan, p. 27.

poetry. For example, the Pope's judgment of the life of Pompilia in Browning's *The Ring and the Book*,

> The marvel of a life like thine, Earth's flower
> She holds up to the softened gaze of God.[6]

is a figure made doubly powerful because of the dual quality of the shared areas of description; but the girl's life and the flower remain distinct objects of God's delight. So also the earth as a place for growing flowers, and the earth as the personification of "the longing of matter after God", are two different ideas about it.

Finally, though the complexity of symbolisms that rest on the poet's art-material provides for no special capacity to "see into the life of things", or to express such insight, on the other hand there is no less insight in poetic than in other expressions, as some of poetry's disparagers believe when they contrast "truth" with "poetry". Even those who would give the poet his due are inclined to imagine that he represents a purely personal point of view. But the fact that his work is a unique and independent vision does not militate in the least against either his truth or its objective validity. The poem insofar as it is published has already proclaimed that the poet's interpretation of the particular theme is as sharable as any other knowledge. For the poet can no more call his poetic vision merely his own than he can say of the flower-bell, sunset touch, or chorus-ending from Euripides, "This beauty is mine alone." The fact remains that poetry in its use of words as symbols, both as material for the art and as symbols attached by the world at large to objects, so far from limiting its ideas subjectively and thus obscuring them, rests its clarity no less than its surety on the inviolateness of definitions.

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[6] *The Ring and the Book*, X.II.1018-19.

REVIEWS OF BOOKS

Formalization of Logic. By RUDOLF CARNAP. (Studies in Semantics, Volume II.) Cambridge, Mass., Harvard University Press, 1943. Pp. xviii, 159.

In this work the author applies the concepts and methods of his *Introduction to Semantics*[1] to a particular problem, namely the development of the semantics of the propositional calculus and (more briefly) the functional calculus of first order. After some preliminary developments—which are in part routine translations, into more exact terminology, of things which are otherwise well known—we come to the author's main results, concerning the existence of "non-normal" true interpretations of the propositional calculus and functional calculus of first order, and the matter of what he calls "full formalizations".

A form of the propositional calculus is used (primarily) in which the primitive connectives are $\sim$ and $\vee$ and in which the rule of substitution and the necessity for propositional variables are avoided by the now familiar device of introducing schemata of primitive sentences instead of single primitive sentences. As atomic sentences there may be either propositional constants or propositional variables or both, and the molecular sentences are constructed in the usual fashion from the atomic sentences by means of the two primitive connectives. The discussion of normal and non-normal interpretations is confined to the case that all the atomic sentences are propositional constants.

A non-normal interpretation of the propositional calculus is one which in some way contravenes the usual interpretation by means of truth-tables with two truth-values. It is shown that the non-normal true interpretations are of two mutually exclusive kinds: (1) those which violate the semantical rule that the negation of a true sentence must be false, and (2) those which violate the rule that the negation of a false sentence must be true.

For Carnap an interpretation of a calculus is merely an assignment of truth-conditions for its sentences, but for purposes of exposition it will be convenient here to speak of the more familiar idea of interpreting a calculus by assigning to each sentence a meaning as expressing a certain proposition. Then, for the propositional calculus, non-normal true interpretations of the first kind are easily obtained by interpreting *every* sentence to express a true proposition—*e.g.*, the various propositional constants could be interpreted as expressing various true propositions, $\vee$ (disjunction) could be interpreted as disjunction in the usual sense, and $\sim$ (negation) could be so in-

[1] See this Review, LII (1943), 298-304.

terpreted that $\sim\mathfrak{S}$ expresses in every case the same proposition as $\mathfrak{S}$.

Examples of non-normal interpretations of the propositional calculus which are of the second kind are somewhat less immediately obvious. In place of Carnap's abstractly formulated examples we here offer the following more concrete one. Suppose that there are just two propositional constants, A_1 and A_2. Let A_1 be interpreted to mean "There are 14 days in a week", and let A_2 be interpreted to mean "There are 21 days in a week". Moreover let every molecular sentence be interpreted to express a proposition "There are n days in a week", where n is some number, and let this be done according to the following rules: (a) if $\mathfrak{S}$ expresses a proposition "There are x days in a week", then $\sim\mathfrak{S}$ shall express "There are z days in a week", where z is obtained as the quotient $294 \div x$; (b) if $\mathfrak{S}_1$ and $\mathfrak{S}_2$ express respectively "There are x days in a week", and "There are y days in a week", then $\mathfrak{S}_1 \vee \mathfrak{S}_2$ shall express "There are z days in a week", where z is obtained as the greatest common divisor of x and y. Then every sentence is assigned a unique meaning as expressing a certain proposition. The interpretation of the calculus so obtained is a *true interpretation* in the sense that every sentence which is true according to the syntactical rules of the propositional calculus (*i.e.*, every theorem of the propositional calculus) is interpreted as expressing a true proposition; and that further, whenever every sentence of a certain class $\mathfrak{R}$ of sentences is interpreted as expressing a true proposition, and the sentence $\mathfrak{S}$ is derivable from $\mathfrak{R}$ according to the syntactical rules of the propositional calculus, then $\mathfrak{S}$ is interpreted as expressing a true proposition. Nevertheless the interpretation is non-normal, since A_1 and $\sim A_1$ both express false propositions; and also since $A_1 \vee A_2$ expresses the true proposition "There are 7 days in a week", although A_1 and A_2 both express false propositions.

The existence of non-normal true interpretations of the propositional calculus is related to the known fact that there exist other truth-tables which yield as true (as tautologies) the same sentences as do the usual two-valued tables. In particular, the elements of any Boolean algebra may be taken as truth-values, with the universal class as the truth-value truth and the other elements of the Boolean algebra as kinds of falsehood, the Boolean sum corresponding to disjunction and the Boolean complement to negation. The above example of a non-normal interpretation of the second kind is an elaborated version of the use of a four-element Boolean algebra in this way. The observation that there exist non-normal interpretations of the propositional calculus was made in particular by B. A. Bernstein.[2] His statement is less exact than Carnap's, but it is evidently non-essential that he uses[3] plane regions rather than propositions as

[2] *Bulletin of the American Mathematical Society*, 38 (1932), 390, and 592.
[3] *Loc. cit.*, 390.

interpretations of the sentences of the propositional calculus—for each plane region could be replaced by the proposition that it is identical with U, the universal or maximum region. Bernstein also anticipates in effect[4] Carnap's conclusion that not every true interpretation of the propositional calculus obeys the laws of contradiction and excluded middle in their semantical versions—the laws, namely, that for every sentence $\mathfrak{S}$ not containing (free) variables not both $\mathfrak{S}$ and $\sim\mathfrak{S}$ are true, and either $\mathfrak{S}$ or $\sim\mathfrak{S}$ is true. The reviewer cannot agree with the opinion of Bernstein and Carnap that this constitutes a shortcoming of the usual logistic formulation of the propositional calculus, nor with Bernstein's proposed remedy, to replace the propositional calculus by "the Boolean logic of propositions", which is not a logistic system but rather a "mathematical science" in his sense.[5] The defect of a Bernsteinian "mathematical science" is that it leaves the underlying logic undetermined, or at best only vaguely determined by a reference to "ideas of general language"; since the consequences of a set of postulates depend as much on the underlying logic as on the specifically mathematical postulates, this does not provide an ultimately satisfactory foundation for any branch of mathematics, but the difficulties are especially acute when the method is applied to logic itself.

Carnap's proposed remedy, although different from Bernstein's, is in the opinion of the reviewer open to objections of somewhat the same order. The importance remains, however, of the striking facts about the propositional calculus which are brought out by Bernstein and by Carnap, and of the contributions to theoretical syntax which are contained in Carnap's procedure.

Carnap first introduces the notions of *conjunctives* and *disjunctives*. These are both thought of as classes of sentences, but a conjunctive and a disjunctive which contain exactly the same sentences are nevertheless not the same; technically, as Carnap points out, we might define conjunctives and disjunctives as ordered pairs, the first member of the pair being a class of sentences in every case, but the second member being say the universal class in the case of a conjunctive, the null class in the case of a disjunctive. A *junctive* is either a single sentence or a conjunctive or a disjunctive. Then the usual syntactical rules for the propositional calculus are modified as follows: the primitive sentences are stated as consequences of the null conjunctive; in the rule of *modus ponens* the two premisses $\mathfrak{S}_1$ and $\sim\mathfrak{S}_1 \vee \mathfrak{S}_2$ are replaced by a single premiss, the conjunctive containing these two sentences; an additional rule of inference makes

[4] *Loc. cit.*, 592. Also in his review of *Principia Mathematica* in the *Bulletin of the American Mathematical Society*, 32 (1926), see 712-713.

[5] In addition to papers already cited, see a paper by Bernstein in the *Bulletin of the American Mathematical Society*, 37 (1931), 480-488, and a criticism of it by E. J. Nelson, *ibid.*, 40 (1934), 478-486.

the null disjunctive a consequence of the universal conjunctive; and another additional rule makes the disjunctive containing $\mathfrak{S}_1$ and $\mathfrak{S}_2$ a consequence of $\mathfrak{S}_1 \vee \mathfrak{S}_2$, in case $\mathfrak{S}_1$ and $\mathfrak{S}_2$ contain no (free) variables. These rules define the relation of *direct derivability* for junctives. A junctive $\mathfrak{T}_2$ is *derivable* from a junctive $\mathfrak{T}_1$ if $\mathfrak{T}_2$ belongs to every class of junctives which (1) contains $\mathfrak{T}_1$, (2) whenever it contains a junctive $\mathfrak{T}$ contains all junctives directly derivable from $\mathfrak{T}$, (3) contains a conjunctive $\mathfrak{R}$ if and only if it contains every sentence in $\mathfrak{R}$, and (4) contains a disjunctive $\mathfrak{R}$ if and only if it contains at least one sentence in $\mathfrak{R}$. This yields a "full formalization of propositional logic", for which non-normal true interpretations are impossible, although the theorems, in the sense of sentences derivable from the null conjunctive, are the same as in usual formulations of the propositional calculus.

The similarity should be noted between Carnap's use of disjunctives and the proposal of E. V. Huntington[6] to include it as a postulate, or as a theorem, of the propositional calculus that if *a + b is in T then at least one of a and b is in T*—where it is intended that the sign + shall be interpretable as representing disjunction, and *T* as the class of true propositions.

The most immediate objection to Carnap's procedure is that it is necessary to make it a part of the definition of a true interpretation of the propositional calculus—when the formalization involving junctives is used—that a disjunctive shall be true if and only if at least one sentence in it is true. *I.e.*, the definition requires that the initially purely syntactical notion of a disjunctive shall be given this particular semantical significance in the interpretation. It would seem to be quite as reasonable to make it a part of the definition of a true interpretation that $\mathfrak{S}_1 \vee \mathfrak{S}_2$ shall be true if and only if at least one of $\mathfrak{S}_1$ and $\mathfrak{S}_2$ is true.

In view of his requirement that disjunctives be interpreted in a particular way, Carnap's use of them is a concealed use of semantics; and in fact, if this arbitrary requirement is dropped, non-normal interpretations of his "full formalization" become possible. The reviewer suggests that non-normal interpretations of the propositional calculus can be excluded only by semantical (as opposed to purely syntactical) rules.

As an alternative to the use of conjunctives and disjunctives, Carnap outlines a method of obtaining a "full formalization" by the introduction of a relation of "involving" (or "involution") between classes of sentences. Syntactically, involution is a generalization of the notion of derivability, or of the related notion of C-implication.

[6] *Transactions of the American Mathematical Society*, 35 (1933), 301; also *Bulletin of the American Mathematical Society*, 40 (1934), 129.

Semantically, $\mathfrak{N}_1$ involves $\mathfrak{N}_2$ if the existence of a true sentence in $\mathfrak{N}_2$ is a consequence of the simultaneous truth of all the sentences of $\mathfrak{N}_1$. This method is open to the same objection as the other, namely that the requirement is arbitrary that the syntactical notion of involution shall receive a particular kind of interpretation. (As a matter of fact Carnap's requirement, in connection with usual formulations of the propositional calculus, that the syntactical relation of derivability receive a particular kind of interpretation, is also objectionable as being arbitrary; but this point happens not to be crucial for the present purpose.)

The reviewer believes, however, that there is a more fundamental criticism to be made of Carnap's procedure. For the purpose of stating this, let us distinguish between *elementary syntax* and *theoretical syntax* on the following basis.

The elementary syntax of a language comprises what syntax must be known (at least implicitly) in order to use the language correctly at all. It is concerned solely with stating the formally correct usage of a language, or calculus—or equivalently, with teaching this correct usage to a learner who understands only the syntax language. As a consequence elementary syntax should require of the learner only that he understand and be able to follow general directions, stated in the syntax language, for the concrete manipulation of physical objects (symbols).—This is a minimum presupposition for the construction of a calculus. It is important that this presupposition is much less, and of a different kind, than the intended content of logical and mathematical calculi which are ultimately constructed by this method, dealing, as the latter do, with abstract objects, infinite classes, relations which may be non-effective (or in Carnap's terminology, indefinite).

Theoretical syntax comprises the remainder of syntax. It deals with questions of what can and cannot be done in the object language, and generally with the mathematical theory of the object language as a formal structure, in abstraction from its meaning. The syntax language used must normally be logically stronger than for elementary syntax, and it may often be as strong or stronger than the object language in its intended meaning.

In appraising the distinction between the two kinds of syntax it is to be remembered that the object language is intended, at least in theory, for use as a language in its own right (however exclusively logicians may be concerned with talking *about* the language). It is true indeed, as Carnap says (113, 114), that the syntax language is necessary in order to state that a particular sequence of sentences is a proof and in order to state derivations from premisses (unless the object language is capable of expressing its own syntax). But the

users of the object language are not in general concerned with stating that a sequence of sentences is a proof, but rather with making the successive assertions which constitute the proof. And (again unless the object language is capable of expressing its own syntax) a derivation from premisses should not be expected in the object language except when the user is willing to assert the premisses outright; in the contrary case its place is to be taken by a proof of a corresponding implication sentence.

Now the users of a language assert single sentences, one at a time. They deal in classes of sentences only indirectly, to the extent that a class of sentences can be represented in this way. *E.g.*, a finite disjunctive may be representable by a disjunction sentence, or an infinite disjunctive may be representable by a sentence containing an existential quantifier. Likewise an involution between two finite classes of sentences may be representable by a sequence of implication sentences.

Carnap's notions of conjunctives, disjunctives, and involution therefore belong to theoretical syntax. They are foreign to elementary syntax, and may not be used in the construction of a calculus.

Finally, in Carnap's treatment of the functional calculus of first order, non-normal interpretations are again obtained on the basis of a formalization of the usual kind, and a similar proposal for a "full formalization" is made. The reviewer has the same criticisms as before. There is, however, the additional point that Carnap now makes it explicit that his method employs non-effective (indefinite) syntactical rules. It is clearly not possible for the users of a language systematically to follow a non-effective rule in practice, and such rules must therefore be excluded from elementary syntax. (They have a place, and perhaps an important one, in theoretical syntax.)

As a matter of fact non-effective rules occur already in the "full formalization" of propositional logic, *e.g.*, the rule which makes each sentence in a conjunctive derivable from the conjunctive—since the definition of a particular class of sentences, even of a finite class of sentences, may well be non-effective.

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Man the Measure: A New Approach to History. By ERICH KAHLER. New York, Pantheon Books, Inc., 1943. Pp. viii, 700.

This book is a work of major importance by an author who is both a competent historian and a genuine philosopher of history. It is an interpretation of the history of Western civilization as a continuous process through critical phases. Mr. Kahler does not undervalue the

historical process of Far Eastern civilization; but, rightly, he says that, up to the present, there has been no evidence of major fructifications from the Far East to the West. The history, the continuity of which he stresses, runs from Iran, Mesopotamia, and Egypt, to America. In tracing the evolution of Western civilization, he refuses to split it into a plurality of selfenclosed cultures, running parallel rhythmic courses, as do both Spengler and Toynbee. (With all due admiration for the stupendous erudition, masterly analyses, easy fluidity of exposition, and synthetic interpretation of Toynbee, I am not yet convinced that Kahler's is not the sounder procedure. Of course one must remember that Toynbee has yet to publish his exposition of the contacts and cross fertilizations of cultures.)

With a fine sense of selection and proportion, Kahler packs into 640 pages the epochally significant stages in the evolution of Western civilization up to and including the present crisis. With penetrative insight and vigor, compactness, and clarity of expression, he threads the exposition of the actual course of history on a genuine philosophy *of* history, and not on reflections *about* history.

The key to this philosophy is the thesis that the truly human power in man is *his capacity for continual selftranscendence*. Man is forever reaching beyond what he actually and existentially is ("The sting that bids nor sit nor stand but go"—Browning). This power of self-transcendence is *spirit*, which has both emotional roots below Reason and the power to transcend Reason. I do not find Kahler's treatment of Reason adequate. When, for example, he calls Hegel the "arch-rationalist", he fails to point out that Reason in Hegelianism is used in the peculiar sense of the speculative synthesis of opposites and even of contradictories—an essentially mystical sense. Kahler himself continually emphasizes the need for coherence, harmony, wholeness; which is what Hegelians are always insisting on.

At the outset of his exposition Kahler starts from the *law of participation* of primitive mentality, of which Lévy-Bruhl is the classical expounder. In the primitive group the individual, as such, has no rôle. The soul of the group—family, clan, tribe, or species—is the source and guardian of the group-life. This is an allpowerful entity. It is the essential life principle. There is as yet no sense of time. "Man's primitive participation with his universe and his community begins to disintegrate as soon as he becomes aware of the *passage of time.*" *The first step in distinctively human evolution consists in man's detaching and discerning a self from a nonself.* The primitive continuum begins to break up. Behind the present arises a past, which for a long time was viewed as fixed in eternity but as flowing into an unchanging present. A system of perennial powers, of deities, arises as an objectivation of the eternal element in the primitive omni-

presence of natural forces. This is the rise of *religion* which succeeds the first stage of participation. With it arise two *focal points of differentiation,* the special participation between the living and the dead, and the specific forms of intercourse in which participation occurred between primitive man and the mysterious environing forces. Art arises as magical attempts at mastery of the mysterious forces. Man's relation to the powers of the universe appears in three successive forms, as *mystical participation, religion,* and *world religion.* The 'sacred' becomes separated from the 'secular' as taboo, and the recognition of individuality emerges first in the person of the priest, king, or chieftain.

This communal or primary collectivistic pattern persisted through all the ancient city-states, even when expanding into empires. Individuality began to emerge in Greece and among the Jews along different lines, and in both cases this emergence culminated in Universal or World Religion, in Greece on a rationalistic basis and in Jewry on the moralistic basis of the ethical universalism implicit in the covenant relationship between the people and Yahweh, and made explicit in the prophets of whom Jesus was the last and greatest.

Athens developed the first and purest democracy. In contrast with modern democracy, which started from free individuality and developed collectivity in nation and state as a *defense* of the rights and freedom of the individual, Athenian democracy was *dynamic* and aggressive. It was a movement from the primitive paramountcy of the communal soul, or life of the species—of tribe and city, towards the equal freedom of all individuals not slaves. It attained universality in the Stoic philosophy.

After the disintegration of Rome's universal empire which, although it became a military despotism, was the medium for the dissemination of Christian universalism, feudalism arose, as a form of mutualism of duties and privileges. The principle of universalism arose again in the two conflicting forms of Papacy and Empire, which conflict finally led to their mutual ruin.

The Renaissance and the Reformation brought in the modern recognition of individuality or personality as a universal principle. Individualism first appeared vigorously in the Italian city-states and then moved northward. Modern democracy started on its career in the Calvinistically influenced countries, Switzerland, the French Huguenots, the Netherlands, Scotland, England, and later the United States. The development of democracy in England was a slow and gradual process. The feudal nobility destroyed itself in the Wars of the Roses, and the later English nobility was largely derived and constantly replenished from the rising bourgeoisie. The increasing power of the bourgeoisie fostered the economic and industrial revolution,

and, through these factors, England established the modern world economy which, of course, was greatly accelerated, from the early nineteenth century on, by the rising tempo of the new technics.

In France the nobility and the kingship retained their privileges stubbornly against the rising bourgeoisie, and this deadlock issued in the cataclysm of the French Revolution, which was essentially an economic and legal overturn which drew its inspiration from England and the American Revolution.

In both England and France the movements toward legal and economic freedom and political democracy worked within the framework of long established *national cultural communities.* Democracy pressed on and transformed these *nation-states. Germany,* on the contrary, *never was a nation* in the homogeneous cultural sense. It was only a conglomeration of feudal states within the loose and increasingly impotent framework of the Holy Roman Empire which became a mere ghost. *The abstract idea of the State,* as the ruling principle, served even by the ruler, attained its most unique and dynamic form in Prussia. There, from the days of the Teutonic Knights, there developed, through the Hohenzollerns, in association with the Junkers, the abstract, stern, and efficient system of totalitarian, militaristic, economic bureaucracy, which, through Bismarck and the Emperor William I, became the dynamic pattern of the whole of Prussianized Germany. The assimilation and manipulation of technics by the totalitarian pattern laid the foundation, when national competitive economics brought on International Civil War I, for Nazism, *which is abstract pure technics employed solely in the interest of world power.* The ultimate *ruthless* rationalization of technics is the total obliteration of individuality and personality. This catastrophic development was, of course, accelerated by the growth of rationalism, the increasing dominance of the scientific spirit in the science of technics culminating in the spread of materialism and the decline of world religion.

Western man has lost faith in personality. His spirit has transcended even personality. The latter is submerged in psychoanalysis, literature, and the other arts, as well as in the most impersonal mechanism of mass production ruled only by the spirit of technics. Ethics is absorbed in technics. Modern man has increasingly mastered the problems of mechanical production, and has so completely failed in the face of the problems of distribution that now the very existence, no less than dignity and savor, of personality are threatened with complete extinction. Having thought he had won freedom, Western man has blindly and greedily used this economic freedom to destroy himself.

Wherein lies the way of salvation? *In the building up of a new, universal, democratic, equalitarian collectivity.*

The private collectivities of capitalistic mass production, operating through nationalistic economico-political systems, have reduced human evolution and progress to an absurdity. If man is to survive and continue to evolve towards a better life, it must be done through the application of his devotion to the *Religion of Humanity,* which does not involve either selfdeification or the silly belief in a speedy millennium, but unswerving *devotion to the idea of man as selfdetermining, selftranscending spirit,* and this on a world scale. The churches cannot do the job. Science must be enlisted in the service of the *superrational end of personal fulfilment through collective cooperation.* The central idea is that of seeking and finding coherence, harmony, moral and spiritual wholeness, through cooperation in the common task of building the "Universal Kingdom of Man".

I have space only to note that this hasty review conveys no adequate picture of the power with which Mr. Kahler has marshalled and driven abreast the interplaying movements, throughout the centuries, of social, political, economic, intellectual, aesthetic, and moral forces. He brings together things new and old in focus on the present crisis. (The sweep of the treatment is shown by the sixty pages of bibliography, notes, and index.)

The selftranscending quality of spirit is as old as the New Testament. Mr. Kahler credits Max Scheler with being the first to bring it out fully. I find it in Jesus, St. Paul, and St. John. Harmony, coherence, wholeness—these moral and spiritual end-values go back to Plato and recur again and again in the ethical literature of both Hegelian and non-Hegelian English and American idealists. To me the most powerful of Mr. Kahler's theses are these—the clamant urgency for a publicly collective control of technics and economy in the interest of a genuine social and cultural democracy, and, therewith, the equal urgency for a world economy controlled by a world master plan, to which social education is the master key. The task may be too great for human power; if so, we may have to give place to the ants. But it is not yet too late, although the time is short and the pace is swift. Mr. Kahler has given us a closely packed, lucidly intelligent, and nobly stirring plea. His is the most nearly adequate philosophy of Western history that I have come across. He does not discuss the question whether the selftranscending quality of the human spirit does not imply some sort of Cosmic Ground. He might say that such questions are beyond the province of a philosophy of history. I would say that either actual humanity is, paradoxically, the Highest Emergent, and a very mixed lot; or there must be a Higher Principle.

J. A. LEIGHTON

THE OHIO STATE UNIVERSITY

The Nature of Explanation. By K. J. W. CRAIK. Cambridge: at the University Press. New York, The Macmillan Company, 1943. Pp. viii, 124.

In this little book the author utilizes the modes of operation of apparatus, such as photoelectric counters, calculating machines, and differential analysers, for the construction of an extreme mechanistic theory of thought.

Inadequate philosophies are first disposed of. According to the author, the final proof of any theory must come from experience. The verbal and formal precision of the symbolic logicians is the last trace of the old *a priori* philosophy which is fated to yield to an experimental approach. The existence of the external world and of causal action is continually shown by the fact that experiment is possible. Scepticism is selfcontradictory because, though sceptical of all else, it assumes the ability of words to symbolize events, an assumption no better and no worse than that of causation. The relational explanation of modern physics is selfcontradictory, because the association of probabilities with events is founded on the theory of probability which is based on rigid causality.

The author offers acute criticisms of philosophical ideas, but acknowledges no difficulties in the conceptual framework of ordinary scientific thinking. The reviewer agrees with the assertion that the development of positive science has demonstrated that principles of explanation are hypotheses subject to modification under the pressure of new phenomena. But this conclusion does not render traditional philosophical problems meaningless, or prove the impropriety of the hypothetical employment of historical solutions. As Helmholtz especially emphasized, an interpretation of positive science can be given in idealistic terms.

The primary purpose of the book is the exposition of a mechanistic theory of thought which is designed from the action of various mechanical devices that perform the work of thinking in science and daily life. The hypothesis is that thought models, or parallels, reality; the essential feature of thought is symbolism which is largely of the kind embodied in mechanical calculating devices. The organism carries a smallscale model of external reality and of its own possible actions within its head. Man's brain is the greatest machine of all, imitating within its tiny network events happening in the most distant stars and predicting their appearances with accuracy. The power of successful prediction and commensuration constitutes the ultimate feature of consciousness. Implication, for example, is the power of these neural mechanisms to operate on each other, so that words or other symbols arouse each other as the real events produce each other.

Our thought has objective validity because it is not fundamentally different from objective reality.

The author demonstrates logical acumen and scientific learning in developing his theory, but does not answer traditional arguments that have been directed against a mechanistic theory. Indeed, he appears to give away his case in the statement on page 94, "we have argued that thought is a term for the conscious working of a highly complex machine, built of parts having dimensions where the classical laws of mechanics are still very nearly true". It is questionable whether it is accurate to assert that a calculating machine parallels the development of strains in a bridge. In a period when rigid mechanism has been abandoned by physics it is surprising to find this doctrine adopted as the foundation for a theory of mental processes.

V. F. LENZEN

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The Philosophy of Thomas Jefferson. By ADRIENNE KOCH. New York, Columbia University Press, 1943. Pp. xiv, 208.

During the Jefferson Bicentennial year which has now passed into history, much was said and written to reëmphasize the persistent curiosity which fired the Sage of Monticello to explore almost every branch of knowledge, and to reveal his remarkable capacity to plumb all the depths and varieties of human experience. Therefore it is fitting and good to have this volume on Jefferson's philosophy, for he was a man of "philosophic substance", if not a systematic philosopher. Dr. Koch has worked through the mass of Jefferson papers and has unearthed several important letters which cannot be found in the so-called complete editions of Jefferson's works; she has studied the books which Jefferson read and the marginal comments he made on them; and she has related Jefferson's reflections on ethics, ideology, natural law, government, education and political economy to the world to which he mentally belonged. This monograph is a valuable and scholarly addition to the literature of the Jefferson Bicentennial. It received the Woodbridge Prize in Philosophy at Columbia, an honor which it richly merits.

Although Dr. Koch does not stress the point, perhaps it should be said that Jefferson was a product of the first American "West". Perhaps that experience made him primarily a social and moral philosopher. He did not care to deal with problems that had no practical bearing upon the actual affairs of everyday life. He loved the common man; he admired his energy, courage and resourcefulness, and he wanted to be optimistic about his essential goodness, and to dream generous dreams of his destiny. He had a deep faith in the special mission of the United States to improve the well-being of man everywhere. He believed in "natural law" and "natural rights", and

interpreted them to mean individual liberty and social freedom, and "human potentialities for freedom and happiness", and his republicanism and his faith in majority rule rested on these fundamental concepts.

At the same time, as a scholar and a friend of the French radical intellectuals, materialists and encyclopaedists, he had a special liking for Destutt de Tracy's "Ideology", and Cabanis' materialistic methodology. The former concerned himself with philosophical inquiries into the thinking faculty of man, and with the knowledge and kinds of proof obtainable thereby. "Ideology" represented a revolt against metaphysics. It stressed the experimental methods of science, and insisted upon observation rather than a priori rationalization. Cabanis divorced psychology from metaphysics, and interpreted it physiologically. Jefferson enthusiastically accepted the principle that experience must be the source and test of all human knowledge ("when once we quit the basis of sensation, all is in the wind") and he was an ardent disciple of science, with a deep resentment for metaphysical speculation. "Absolutes", whether political, moral or religious, did not exist for Jefferson.

Jefferson's "philosophical substance" probably was the result of the blending of his practical observations in the emerging America with the influence of French ideologists, Scotch realists like Dugald Stewart, and the Epicureanism and Stoicism of antiquity. To this must be added the impact made by Christianity, in that unadulterated form by which Jefferson reduced it to a system of ethics which emphasized inward motive and intention, and love for one's fellow man.

Jefferson believed that a "moral sense" was part of man's nature, written in the hearts and heads of "every rational and honest man". He had faith, albeit a critical one, in ideals. He believed all people would profit by education; that it must be the cornerstone of an orderly and happy society; and that only by the spread of knowledge could man's well-being be increased. He cherished the humanitarian ideals of Jesus, and he resolved his own inner conflicts by remaining a deist, after the English rather than the French pattern. Though prolific on most matters, Jefferson was unusually reticent about religion. He attended church regularly, carried his own prayerbook, and had his children baptized. He admitted that man could be moral without practising religion or believing in God, and he pointed out that in history, chance and circumstance had often proved to be as potent as rational processes. But the agnostic positivist stopped short of the logic of complete materialism. He retained in his thinking a benevolent and intelligent Creator of an "orderly" Universe, and he rejected the hypotheses of chance or blind necessity.

CARL WITTKE

OBERLIN COLLEGE

The Decline of Liberalism as an Ideology, with Particular Reference to German Politico-legal Thought. By JOHN H. HALLOWELL. *University of California Publications in Political Science,* Vol. I, No. 1. Berkeley and Los Angeles, University of California Press, 1943. Pp. xiv, 145.

This monograph was originally a dissertation offered for the doctorate at Princeton. It develops the thesis that liberal thought in Germany could not have been so easily and so completely destroyed if it had not already degenerated to a point where it had lost its hold upon men's minds. This view presumes a stage of what the author calls "integral liberalism" and the process by which its degeneration took place. Accordingly the book begins with a sketch of the theory of natural, inalienable rights current in the seventeenth and eighteenth centuries. The degenerative influences that affected this theory were historicism and positivism. "By rejecting everything that transcends experience, positivism undermines the idea of law as being filled with substantive content in the sense of eternal truths and values" (69). As a consequence rights which had been conceived to be substantial were formalized, and jurisprudence became a formal science in the hands of Gerber, Laband, and Jellinek. The process culminated in the theories of "pure law" of Stammler and Kelsen (on the normative or Kantian side) or in the relativism of Lasson and Kohler (on the historical or Hegelian side). The upshot was much the same in both cases: irresponsibility on the part both of the state and of the individual. Such a degeneration was possible because liberalism had from the start contained two independent juristic theories, the doctrine of consent and the doctrine of the objective moral value of the law (110). The first is formal and the second is substantive. The degeneration of liberalism came about when positivism led to the eliminating of the second and the retention of the first.

The general bearing intended by Mr. Hallowell's argument is obscure to me. When he says that "the gradual infiltration of positivism into all realms of thought" was the most important factor in the decline of German liberalism, he may regard this merely as a statement of historical fact. If so, there is nothing to be said, provided he can make out the very difficult correlation that his statement implies. Or he may intend merely a psychological generalization about human nature: that men cannot retain liberal purposes unless they also have certain beliefs, delusive or otherwise, about values—a very uncertain proposition. Or he may mean that logically modern science does entail positivism and positivism does entail the denial of liberalism, which would require a meticulous analysis of

science, positivism, and liberalism. Or finally he may mean that because liberal values are objective, science and positivism must be wrong, which seems to me very dangerous doctrine. I doubt whether anyone but a theologian supposes that he knows what should be meant in this age by "objective values", and it seems a pity to read out of the party those men of liberal sympathies who cannot feel unquestioning certainty about a new form of orthodoxy.

GEORGE H. SABINE

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The following books have been received:

The Theme of Plato's Republic. By ROBERT GEORGE HOERBER. A Dissertation. Saint Louis, Missouri, 1944. Pp. x, 119. (Eden Publishing House, 1724 Chauteau Ave., St. Louis, Mo.)

The Bhagavad Gita. Translated from the Sanskrit, with Notes, Comments, and Introduction by SWAMI NIKHILANANDA. New York, Ramakrishna-Vivekananda Center, 1944. Pp. xviii, 386.

The Bhagavad Gita. Translated by SWAMI NIKHILANANDA. New York, Ramakrishna-Vivekananda Center, 1944. Pp. xxix, 226.

The Philosophy of Bertrand Russell. Edited by PAUL ARTHUR SCHILPP. Evanston and Chicago, Northwestern University, 1944. Pp. xvi, 815.

Process and Polarity. By WILMON HENRY SHELDON. New York, Columbia University Press, 1944. Pp. xvi, 153.

Thomas Traherne. By GLADYS I. WADE. With a selected bibliography of criticism. By ROBERT ALLERTON PARKER. Princeton University Press at Princeton, New Jersey, 1944. London: Humphrey Milford, Oxford University Press. Pp. x, 269.

The Babylonian Talmud in Selection. Edited and translated from the original Hebrew and Aramaic by LEO AUERBACH. New York, Philosophical Library, 1944. Pp. 286.

The Problem of Pain. By C. S. LEWIS. New York, The Macmillan Company, 1944. Pp. x, 148.

The Scientific Spirit and Democratic Faith. Papers from the Conference on The Scientific Spirit and Democratic Faith: Held in New York City, May, 1943. New York: Morningside Heights, King's Crown Press, 1944. Pp. xii, 92.

Kierkegaard and the Levels of Existence. By REID MACCALLUM. A Reprint. Toronto, *The University of Toronto Quarterly*, n.d. Pp. 258-275.

Loys le Roy: *De la vicissitude ou variété des choses en l'univers.* Selections with an introduction by BLANCHARD W. BATES. Princeton, Princeton University Press, 1944. Pp. xvii, 54.

Montesquieu: *Extraits sur le loi, la liberté, et le gouvernement anglais.* With an introductory essay by ROGER B. OAKE. Princeton, Princeton University Press, 1944. Pp. xiv, 46.

H. Taine: *Introduction à l'histoire de la littérature anglaise.* Avec des remarques préliminaires par GILBERT CHINARD. Princeton, Princeton University Press, 1944. Pp. xix, 29.

Ernest Renan: *Les Sciences de la nature et les sciences historiques* (lettre à Marcellin Berthelot) & *L'Avenir de la science* (chapitres II et XVI). With an introduction by IRA O. WADE. Princeton, Princeton University Press, 1944. Pp. xxi, 43.

El orden nuevo de Hitler. R. P. DE ROOY. Traduccion de Francisco Javier A. Belgodere. Mexico, D. F., 1944. Pp. 40.

For Self-Examination and Judge for Yourselves! and Three Discourses, 1851. By SØREN KIERKEGAARD. Translated by WALTER LOWRIE. Princeton, Princeton University Press, 1944. Pp. x, 243. (London: Humphrey Milford, Oxford University Press.)

Training in Christianity and the Edifying Discourse which 'accompanied' it. By SØREN KIERKEGAARD. Translated with an Introduction and Notes by WALTER LOWRIE. Princeton, Princeton University Press, 1944. Pp. xxviii, 275. (London: Humphrey Milford, Oxford University Press.)

Christianity and Democracy. By JACQUES MARITAIN. Translated by DORIS C. ANSON. New York, Charles Scribner's Sons, 1944. Pp. 98.

Proceedings of the American Catholic Philosophical Association. Volume XIX: Philosophy in Post-War Reconstruction. Nineteenth Annual Meeting, December 29 and 30, 1943. Washington, D.C., The Catholic University of America, 1944. Pp. 200.

The Autobiography of Giambattista Vico. Translated from the Italian by MAX HAROLD FISCH and THOMAS GODDARD BERGIN. Ithaca, New York, Cornell University Press, 1944. Pp. x, 240.

Moira: Fate, Good, and Evil in Greek Thought. By WILLIAM CHASE GREENE. Cambridge, Harvard University Press, 1944. Pp. x, 450.

NOTES

The following interim report on the work of the Commission on the Function of Philosophy in Liberal Education has been received.

The Commission is preparing its report on the many subjects which emerged for consideration in the course of its inquiry. The report will comprise two publications, one intended for the profession and for those who are concerned in any way with philosophy and education, the other a work for the general public. In the first we hope to communicate something of the experience we have had in the various Regional Conferences and to present a general view of the testimony and the issues as they were discussed there and in the many significant letters sent to us. We shall also give our findings on the major questions. In the second publication the individual members, writing more freely, will discuss special topics in which they are respectively concerned and which we believe are of wider interest in the community.

There have been some unavoidable and important interruptions of our work which caused delay. Every member of the Commission has had additional responsibilities during the past months when institutions of learning generally have been looking into the state of education and trying to plan for the post-war situation. In addition, two members were chosen by a Committee on the American Council of Education to advise concerning a course in Philosophy which the Armed Forces Institute desired to make available to men and women in the services, and these members felt obliged to respond to the request that they take part in the writing of a new text, a task which occupied the greater part of their time from January to the middle of April. (A detailed notice about this course in Philosophy is being published in the various philosophical periodicals.) In consequence of these added duties we have had to postpone the date of our final report to the American Philosophical Association. Appreciating the reasons for this delay, the Rockefeller Foundation has extended the date of termination of the grant from June 30th to December 31st, 1944.

Since our work is still in progress, we remain open to the advice of those who have already been so encouraging and helpful. If you have any further reflections on matters discussed at the conferences or any new suggestions, we should be grateful to have them. Some colleagues have been moved to write their views for publication; we should like reprints of published articles and copies of others that may have been prepared with a view to publication. We should welcome, too, information about local or professional conferences which deal with any aspect of our problem.

Among our letters are a number from young men in the armed forces, some of them former students in philosophy, some of them men who have had no instruction in it. These letters have been deeply appreciative of philosophy. Since the views of those in active service are valuable to us and at the same time difficult to gain, we should be glad to know of other communications of that sort which you or your acquaintances may have received.

CHARLES W. HENDEL, *Secretary*

The following is a list of articles in current philosophical periodicals:

MIND LII 210: *C. D. Broad,* Hr. Von Wright on the Logic of Induction (II); *A. C. Ewing,* Subjectivism and Naturalism in Ethics; *J. N. Findlay,* Morality by Convention; *John Wisdom,* Philosophy, Anxiety and Novelty.

THE JOURNAL OF PHILOSOPHY XLI 10: *William Curtis Swabey,* The Causal Definition of Existence; *Virgil C. Aldrich,* John Dewey's Use of Language. 11: *John Dewey,* By Nature and by Art; *George R. Geiger,* Can We Choose between Values?; *Edith Watson Schipper,* Existence and Common Sense. 12: *Philip Blair Rice,* Toward a Syntax of Valuation; *David L. Miller,* The Calendar Theory of Freedom; *Raphael Demos,* Brief Meditation upon Value. 13: *Otis Lee,* Value and the Situation.

ETHICS LIV 3: *John H. Hallowell,* Compromise as a Political Ideal; *Hans J. Morgenthau,* The Limitations of Science and the Problem of Social Planning; *A. Campbell Garnett,* Relativism and Absolutism in Ethics; *Eugene H. Sloane,* How To Be; *Allan G. Gruchy,* Facts and Reality in the Social Sciences; *James Feibleman,* The Ethical Basis of Chinese Unity.

PHILOSOPHY OF SCIENCE XI 2: *William E. Ritter,* Logic in Our Common Knowledge or Logic in the Light of Common Sense, Common Knowledge, and Common Understanding; *Virgil G. Hinshaw, Jr.,* The Pragmatist Theory of Truth; *Edward Sapir,* Grading, A Study in Semantics; *James Feibleman,* The Mythology of Science.

SOCIAL RESEARCH XI 2: *Max Ascoli,* The Lesson of Italy; *Robert Ulich,* The Problem of German Reeducation; *Erich Hula,* The Nationalities Policy of the Soviet Union—Theory and Practice; *Eduard Heimann,* The Central Theme in the History of Economics; *Herbert Block,* European Transportation under German Rule; *L. Albert Hahn,* Capital is Made at Home.

THE PERSONALIST XXV 2: *The Editor,* Personalism As a World Movement; *Herbert L. Searles,* The Personalist Movement in Psychology; *Arthur Henry,* The Social Attitudes of F. C. S. Schiller; *Albin R. Goldschmied,* The Post-War Function of Philosophy; *Robert F. Creegan,* A Personalist Theory of Human Emotions; *Paul R. Helsel,* Personalism As the Basis of Religious Experience; *Isabel Harriss Bar,* Verse: Lost Country; *John Lehman,* Poets and Patriots; *Mary Sinton Leitch,* Verse: Challenge.

THOUGHT XIX 73: *J. Manuel Espinosa,* Intellectual Life in Contemporary Spain; *Nicholas H. Heck,* The Jesuit Contribution to Seismology in the U. S. A.; *Louis J. A. Mercier,* Maritain's Conception of Integral Humanism; *James Edward Tobin,* Alexander Pope, 1744-1944 "Satire and Sense"; *Anton C. Pegis,* Cosmogony and Knowledge, The Dilemma of Composite Essences; *Alfons Nehring,* Asiatic Invasions and European Culture; *Mary T. Loughlin,* St. Teresa of Avila's South American Brothers.

THE REVIEW OF POLITICS VI 2: *Thomas T. McAvoy,* American Catholics and the Second World War; The Russo-Polish Dispute: *Waclaw Lednicki,* The Historical, Cultural and Political Background—*N. S. Timasheff,* A Study in the Theory of Territorial Settlements; On the Peace: *Hans Rommen,* Realism and Utopianism in World Affairs—*Stefan T. Possony,* No Peace Without Arms—*Waldemar Gurian,* Perpetual Peace?

JOURNAL OF THE HISTORY OF IDEAS V 3: *Walter Eckstein,* Rousseau and Spinoza on Freedom; *Alfred O. Aldridge,* Eclecticism of Akenside's *The Pleasures of Imagination; Robert A. Nisbet,* De Bonald and the Concept of the Social Group; *Martha Wolfenstein,* The Social Background of Taine's Philosophy of Art; *Oscar Sherwin,* Defoe Reviews World War II; *Joseph Katz,* A Reply to J. Huizinga on the Form and Function of History.

THE NEW SCHOLASTICISM XVIII 2: *Anton C. Pegis,* In Defense of St. Augustine; *John Wellmuth,* Two Views on Immediate Inference; *Edward Sutfin,* Bacon's Opinion of His Predecessors; *G. Kasten Tallmadge,* ΝΟΥΣ and Naturalism; *Gerald B. Phelan,* A Note on the Formal Object of Metaphysics; A Bibliography of the Writings of John F. McCormick.

SPECULUM XIX 2: *A. E. Prince,* The Payment of Army Wages in Edward III's Reign; *G. P. Cuttino,* The Process of Agen; *Kenneth M. Setton,* Athens in the Later Twelfth Century; *Wolfgang Born,* The Introduction of the Bulbous Dome into Gothic Architecture and Its Subsequent Development; *Lloyd Hibberd, Estampie* and *Stantipes.*

PHILOSOPHIC ABSRACTS Number 12, 13-14.

THE AUSTRALASIAN JOURNAL OF PSYCHOLOGY AND PHILOSOPHY XXI 2 and 3: *J. A. Passmore,* Logical Positivism (I); *A. D. Hope,* The Esthetic Theory of James Joyce; *John Anderson,* The Servile State.

PSYCHOLOGICAL REVIEW LI 3: *Wolfgang Köhler,* Max Wertheimer: 1880-1943; *George Malcolm Stratton,* Violence Within the Nation; Treatment, Particularly in the United States; *Paul Crissman,* Are Psychological Data and Methods Subjective?; *H. Israel* and *B. Goldstein,* Operationism in Psychology; *William R. Sickles,* Psycho-Geometry of Order; *E. Simon,* Moshe Brill: 1910-1943.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY XXXIV 3: *A. Anastasi* and *J. P. Foley, Jr.,* An Experimental Study of the Drawing Behavior of Adult Psychotics in Comparison with That of a Normal Control Group; *H. B. Lewis* and *M. Franklin,* An Experimental Study of the Role of the Ego in Work: II. The Significance of Task-Orientation in Work; *F. A. Mote,* The Effect of Different Amounts of Reinforcement upon the Acquisition and Extinction of a Simple Running Response; *J. P. Seward, J. B. Dill,* and *M. A. Holland,* Guthrie's Theory of Learning: A Second Experiment; *E. G. Wever* and *K. R. Smith,* The Problem of Stimulation Deafness: I. Cochlear Impairment as a Function of Tonal Frequency; *M. D. Eysenck,* An Experimental and Statistical Study of Olfactory Preferences; *H. B. Carlson* and *A. J. Ebel,* A Dual Selective Amplifier.

PSYCHOLOGICAL BULLETIN XLI 6: *John E. Anderson* and *Willard L. Valentine,* The Preparation of Articles for Publication in the Journals of the American Psychological Association; *Betty L. Spencer,* Psychological Disorders Resulting From Electrical Shock; The Fifty-Second Annual Meeting of the American Psychological Association, Cleveland, Ohio, September 11 and 12, 1944; *Various Authors,* Psychology and the War.

THE NAHA-BODHI LI 3-4: Vaisakha Celebration; *Justice Edgley,* Sanchi; *Bhikkhu Metteya,* Dharma-Bijaya; *Basil Crump,* "Buddhism and Defence"; *Sri Bhabani Churn Law,* Indian Influence on the Art of Ceylon; *Manindra*

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